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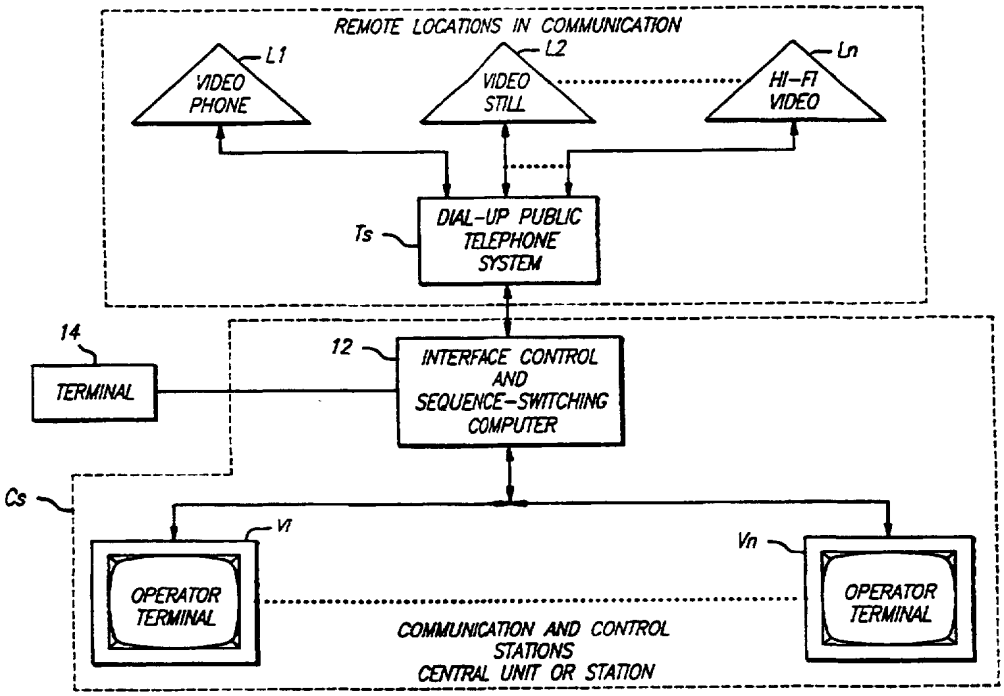
(54) Title: INTERACTIVE SYSTEM FOR TELEPHONE AND VIDEO COMMUNICATION INCLUDING CAPABILITIES FOR REMOTE MONITORING

(57) Abstract

An interactive system for telephone and video communication between a plurality of widely distributed, remote locations and a central location is disclosed. The interactive system may be configured to provide remote monitoring capabilities, scheduling and processing capabilities, commercial product routing and video vending. In one embodiment, the interactive system selectively interfaces members of plural groups, as buyer groups and vendor groups, for video communication through a dial-up telephone system, to analyze and compile data, schedule appointments, implement conferences, consummate sales and the like. The interactive system comprises a telephonic interface apparatus for interfacing remote telephonic terminals of the dial-up telephone system identified with the members of plural groups, a video recording unit for recording and playing video transcriptions, a storage memory for storing data on the members, including telephonic terminal numbers and area-of-interest codes and a control computer to selectively interconnect the video recording unit with the remote telephonic terminals through the telephonic interface apparatus to record and receive video communication.



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Interactive System for Telephone and Video Communication Including Capabilities for Remote Monitoring

FIELD OF THE INVENTION

The present invention relates generally to the field of computerized telephone and video communication, and more particularly, to a system for telephone and video communication between remote locations and a central station, accommodating monitoring capabilities, scheduling and processing capabilities, and traffic control capabilities for selectively interfacing members of plural groups, for example, buyer and vendor groups. The monitoring capabilities of the system may be used for applications, such as for security, surveillance, quality control and inspection, regulation of food and/or other standards in food-related and other facilities, market research, remote monitoring of deposit and withdrawal of funds at bank vaults, grocery chains, convenience stores, and the like. The scheduling and processing capabilities of the system may be used for a variety of applications, such as for conferences related to merchandising, including purchasing, selling, marketing or the like, educational conventions for medical doctors and other professionals, game shows and so on. The traffic control capabilities of the system may be used for directing and exchanging offers and responses at the wholesale level, between selective members of plural groups, for analyzing and compiling data, scheduling and implementing conferences, consummating sales and the like.

BACKGROUND OF THE INVENTION

Over the years, a multitude of security and surveillance systems have been proposed for monitoring various locations for different reasons. As an example, it may be particularly desirable to monitor locations involving

some exposure to risk or peril. In such cases, generally, the objectives have included discouraging an intruder, notifying security personnel, as police, and providing some form of record of any criminal or culpable activity.

Various forms of photographic devices have been proposed for use in such systems; however, the advent of television substantially enhanced the possibilities for scrutiny or surveillance of a location. In that regard, large modern office buildings are seldom without an internal closed-circuit system with a guard station displaying several significant locations within the building. Accordingly, a single guard can monitor a sizeable building, summoning help to a problem location. Furthermore, it has been proposed to record monitor displays for subsequent study and analysis in the event of a crisis.

While previous monitoring systems have been effective, particularly in conjunction with a single facility, there have been attendant limitations. For example, simple television displays often do not clearly manifest a potential or existing problem. Also, such systems are not susceptible to programmed operation, enabling an expert to flexibly monitor a sizeable number of individual locations. Thus, the present invention recognizes the need to expand the capability of monitoring to accommodate security locations over a widely distributed area. As a further consideration, needs also are recognized for increased communication capability, enhanced displays and expanded control of the displays.

Surveillance of facilities for reasons other than security traditionally involve substantial human involvement. For example, routine inspection of facilities to control quality, regulate and maintain food and/or other standards at franchise and/or company-owned locations (e.g. fast food facilities) or the like, traditionally have required personal visits to such facilities by inspectors employed for such purposes. Unfortunately, more time and expense is incurred in travelling to and from different

facilities than is desirable. Moreover, as a practical matter, specific inspectors and/or branch managers are assigned to specific areas, resulting in a need for more inspectors dedicated to inspecting limited areas.

The present invention recognizes the need to perform inspections as for controlling quality, etc., at remote locations over a widely distributed area from a central location. Likewise, the present invention recognizes the need for remote monitoring of deposit and/or withdrawal of funds or executing other transactions at bank vaults, grocery chains or convenience stores, and the like, to deter foulplay and/or prevent burglaries. In addition, the need for conducting discrete or interactive market research is also recognized.

As another example, drug and medical device manufacturers typically hire "detail" persons to travel and visit medical professionals, such as doctors, pharmacologists, hospital representatives or the like, located at widely distributed areas around the country and the world to introduce details on new drugs and demonstrate new medical devices. These "detail" persons generally spend a majority of their time waiting to see medical doctors, often to receive only a few minutes of a doctors precious time. Many times, the waiting proves to be futile, especially in circumstances where doctors are summoned for emergencies or are otherwise busy. Also, time is wasted as a consequence of uncertain schedules.

To consider an example of cumbersome communication in the merchandising industry, wholesale vendors or sellers of goods typically spend many hours attempting to schedule appointments with various buyers for different organizations, travelling to and from the buyers' facilities, and waiting for meetings, which may sometimes last only a short duration. Unfortunately, considerably more time and expense is incurred, in travelling to and from different facilities, than is desirable. Moreover, as a practical matter, specific vendor sales people are typically

assigned to merchandise specific goods and interact with specific buyers, resulting in a need for more vendor personnel dedicated to particular buyers.

Moreover, in the event a specific seller wishes to broadcast a special offering of a particular item to plural buyers, for example, to dispose of an inventory of distressed items, the seller must undertake considerable effort, such as place an advertisement or otherwise initiate contact with buyers. An advertisement is likely to be viewed only by random buyers, thus, not always proving to be a reliable method of soliciting offers from all possible buyers. Moreover, initiating individual contact with a series of buyers, until eventually securing a final sale, constitutes an arduous task. Similarly, in situations where a buyer wishes to solicit proposals from vendors for a particular item, the same practice prevails.

Accordingly, the present invention recognizes the need for a system to communicate with remote locations over a widely distributed area, from other places, such as a central location, for the applications discussed above, as well as many other diverse applications with similar requirements. In particular, the present system recognizes the need for directing and exchanging communications, such as offers and responses, between select members of plural groups or sub-groups, analyzing and compiling data relating to such members, scheduling appointments, implementing face-to-face conferences (in real-time), consummating transactions and billing charges relating to transactions between such groups.

In a related context, integration of computer and telephone technologies has brought many advances in the telecommunications industry. Functionally integrating human operators with telephone network capabilities, voice and data switching capabilities, computer applications and databases, and voice processing technology, not only provides human operators with immediate access to information from a wide variety of sources, but, allows them

to intelligently process each call as well. Telephone switches are linked with computers to coordinate computer information and intelligence with call handling capabilities to automatically add relevant data, as well as facsimile, graphics, video or audio communication capabilities. Select services or equipment, such as automatic number identification (ANI) or dialed number identification service (DNIS) enhance calls and human capabilities by forwarding identifying information preceding a telephone call, thereby, eliminating steps otherwise performed by people to capture information regarding the caller. For applications involving large scale processing of calls, switch and host databases automatically link calls with a caller's record, eliminating the need for the caller to enter an identification number when using a voice response system.

More revolutionary applications use ANI to simultaneously pass both the call and the caller's current record to an operator's telephone and terminal. This obviates the need for a person to obtain, enter and receive the caller's record from the database. Such advances have immensely enhanced human capabilities for communication, data manipulation and control functions.

Somewhat concurrently, rapid developments in computer, telephone and video technologies have introduced the concept of visual communications or video conferencing. In particular, efforts at integrating these technologies have gained enormous momentum in recent years, resulting, in part, from a general desire in all industries to conserve time and expenses, and thereby, maximize human efficiency and productivity. The advent of videophones has enabled users to visually communicate from remote locations. Many industries are rapidly embracing the idea of video conferencing or visual communication to eliminate escalating travel expenses. Employees or customers in different places can take part in interactive training sessions or seminars with no loss of time for travel.

However, obstacles remain, particularly, in traditional areas of cumbersome communication. Still, with developments, virtually every industry segment can profit from interactive data sharing in real time with the added advantage of face-to-face communication. Innovative technical advances are fast satisfying promises of enhanced capabilities, thereby, allowing users to share and manipulate images from remote locations, such as pictures, graphs, maps or the like.

Technical breakthroughs in audio and video compression technology make desktop video conferencing and visual communication both economical and practical for everyday business communications. To fully participate in video conferencing, the user's equipment must communicate with similar units, albeit, from different equipment vendors. The International Telephone and Telegraph Consultative Committee (CCITT) has defined a standard called H.261 (or "Px64") detailing how video and audio signals are compressed and decompressed for transmission across a common link. At present, no one industry standard and format has been adopted for video conferencing systems. Thus, the systems available on the market are not always compatible. As a consequence, many different types of video codecs (coders/decoders) are currently in use. For example, the AT&T AVP CODEC is a three-chip set that digitally processes high quality, full motion video images and sounds that are compatible with the latest videoconferencing standards.

At any rate, ongoing efforts at achieving compatibility and providing compression schemes that can transmit color images over POTS (plain old telephone system) all over the world are in the offing. Approaches for incorporating live-action, color video with standard voice telephone lines via networks and modems are currently being introduced. By using a suitable video capture board and a modem, live video may be received and displayed on any 386 or 486 personal computer running Microsoft Windows™. The frame rate depends upon the type of display and type of communication hardware.

For example, over a normal dial-up telephone line, a computer with a VGA (video graphics array) display set at 32,000 colors, a 486 CPU and a 14.4 kbs (thousand bits per second) modem can achieve a frame rate of 5 frames per second. The link between the personal computers can be established in several ways, for example, by a modem, LAN (local area network), serial port and other high speed digital links.

To address the existing needs discussed above, the present invention recognizes use of recent telephone and video advances in creating an improved system with multiple capabilities.

SUMMARY OF THE INVENTION

Generally, the system of the present invention involves telephone and video communication between a plurality of remote, widely distributed locations, and a central unit utilizing dial-up telephone facilities in today's computer environment with voice quality lines under computer control.

Specifically, for example, the dynamic graphics of telephonic video (on standard analog lines and digital lines over Integrated Services Digital Network (ISDN)) are controlled to facilitate videophone, while video still displays and digital lines facilitate high fidelity (hi-fi) video displays along with audio capabilities, all combined with the interactive capability of computers to attain an effective interactive system, which may be configured to provide various functions, e.g., scrutiny or surveillance capabilities, scheduling and processing capabilities or commercial product routing and video vending capabilities.

The surveillance capabilities of the present system may be used in applications ranging from, combatting armed robberies and burglaries to quality control and regulation activities in food and other facilities, as of food and sanitation standards and the like, discrete or interactive monitoring for market research, monitoring of deposit and

withdrawal of funds, as at bank vaults, grocery chains and convenience stores, and so on.

The scheduling, processing, product routing or video vending capabilities may be used in applications ranging from, merchandising (including purchasing, selling, marketing or the like) to educational conventions for medical doctors and other professionals, game shows, dating services and so on. In such applications, the present system may be configured to direct and exchange communication traffic, for example, in the form of offers and responses, between selective members of plural groups or sub-groups, such as vendors and buyers, for analyzing and compiling data, scheduling appointments and implementing visual conferences, consummating transactions and the like. Selective routing of communication traffic from a central unit or controlled by the central unit effectively prevents information overload.

In the disclosed embodiments of the present system, videophone cameras, speakerphones or regular telephone instruments (for one-way or two-way communication), personal computers equipped with capabilities for providing either analog video (analog motion and analog high resolution freeze frame) or digital video or both, are placed at remote locations to communicate with a central system that may include several communication and control stations, which may likewise be equipped with some or all of the same capabilities. As a part of surveillance, scheduling, or product routing operations, a video display (depicting motion and color) may be provided with graphics, audio and data signals at each communication and control station, as well as the remote locations, as required. The videophone camera or personal computer may utilize well known image enhancement techniques to allow high resolution images for closer observation.

In one exemplary operating format related to surveillance operations, identification designations for scrutiny or surveillance locations are provided in sequence

to address a memory for fetching telephone numbers, other working data and/or graphic display data. Accordingly, in sequence, surveillance locations are dialed up via the public telephone system to obtain audio-video communication providing an image of the location scene. Additionally, data associated with the location is graphically displayed for convenient reference. For example, it should be noted that for security applications, response time (e.g., to call the police) is often critical, thus, having and displaying the data in conjunction with the video allows for action to be taken immediately if required, either automatically or manually. Note also that the display also may include, the location and graphical data indicative of the floor plan of the premise scrutinized, for example, the physical location of entry/exit points and the corresponding streets provided simultaneously with the video scene images.

The sequence of displays may be random or predetermined, as programmed along with intervals of display. For example, a remote location under scrutiny might be observed for thirty seconds once every ten minutes. Alternatively, at a single remote location, varied observation times for different cameras installed may be programmed. For example, when viewing a bank having a plurality of cameras, the view from a first camera might be taken for twenty seconds, followed by a view from a second camera for ten seconds, then zooming onto a vault that would appear in the view from a third camera for ten seconds.

For each scene display, a graphic display of pertinent data is provided, for example, indicating the telephone number, the location name, e.g. a bank, market or inspection site, the address of the location, the telephone number of the police station serving the location for security applications, key personnel at the location and so on. When monitoring banks and other types of locations susceptible to robbery, the status or nature of the situation, e.g., an "emergency" or "alert", also may be displayed. A detector for detecting situations when a camera is inoperative, as

where the lens is covered to prevent observation, may be used to convey another "alert" situation.

On command, either from a scrutiny location or the central station, a communication may be commanded to indicate a situation. Special controls may be instituted enabling manifestations at the scrutiny location to initiate action or alter the display. Special operations also may be commanded through a videophone, either on manual initiative or automatically by sensor apparatus.

At each control unit, multiple operators at single monitors may be utilized, with calls sequenced to each operator depending upon the cumulative handling capability of each operator. For example, if a particular operator is handling calls at the average rate of six seconds each, calls to that operator will be sequenced at that rate. Alternatively, a single operator viewing a single monitor or multiple monitors is also contemplated. Furthermore, selective distribution of calls may be appropriate, for example, calls reporting on "emergency" situations may be forwarded to a particular operator trained in emergency procedures. Alternatively, calls may be routed to the next available operator. In addition, as the calls are queued in sequence, calls reporting "emergency" or "alert" situations may precede other routing calls in accordance with an override feature.

In accordance with one exemplary embodiment related to wholesale merchandising, the system may include a central traffic control system, independently managed by a third party and located remote from all vendors' and buyers' facilities. The central traffic control system schedules appointments and routes offers and responses to and from select members of plural groups, such as buyers and vendors, to expedite traditionally complex purchasing operations. Routing of offers and responses may also take place between members of sub-groups of plural groups. Calls may be classified into types, for example, a vendor with a special offering, a buyer responding to a special offering, a buyer

soliciting proposals, a vendor responding with a proposal and a vendor or a buyer seeking an appointment. Calls of the various types may involve some form of qualification or approval. For example, access to the system may be limited to qualified or registered entities. Also, certain limitations may be imposed, such as calls revealing one vendor's proposal to a competitor are generally inhibited.

In accordance with an example, a vendor may wish to broadcast a special offering of a particular item to interested buyers. The routing system analyzes buyer data, typically acquired during registration, and compiles a list of buyers to whom the broadcast is transmitted. Special buyers may be specified by the vendors making the special offering. For example, a vendor may designate special buyers from a list of all participating buyers and vendors provided to each registered member. From time to time, periodic updates on new members may be circulated.

To facilitate equitable routing of special offerings to all interested buyers, in situations, where there are only a limited number of communication lines, the routing system may include a random number generator to randomly select subsets of buyers and may transmit the broadcast in sequence to each subset. In some situations, the routing system may have the capability to request and add additional communication lines in the event a caller (vendor or buyer) desires concurrent broadcast to all potential receiving parties. Of course, in such cases the caller would incur the additional charges. A numbering system may also be adopted, whereby broadcasts are transmitted to subsets of a designated number of buyers (for example, equal to the number of communication lines) in rotating sequence. For example, a particular special offering may be broadcast first to subset number one, then subset number two and so on, while the next special offering may be broadcast first to subset number two, then subset number three and so on. A video recording of the offered item may be stored in a video file server at the central location, thus, allowing

interested buyers to view the item prior to making a purchase. In the event, buyers purchase a fraction of the inventory, a tally for the inventory is maintained. Likewise, buyers may wish to solicit proposals for a particular item from vendors qualified for designated merchandise. Communication between the routing system and the different buyers and vendors may be accomplished in a variety of ways, as for example, by electronic-mail (transmission of messages across a network between two desktop PCs), electronic bulletin boards, on-line computer services (such as Prodigy® or CompuServe®), facsimile, voice-mail or the like.

Vendors and buyers may directly communicate with the central traffic control system to seek or change appointments and update information with respect to appointments with specific buyers. In accordance with one scenario, vendors may call the central traffic control system and, upon qualification, schedule appointments with specific buyers.

Appointments may be executed, on command, from a buyer location or the central traffic control system. Communication may be initiated conforming to the display capabilities at the vendor site. That is, as disclosed, the central traffic control system or alternatively, plural coordinated such systems (located at one site or plural sites), as well as the buyer locations, incorporate multiple video format capabilities along with a bridge or switch unit to drive a display unit or monitor in a selected format in accordance with the capabilities of the current vendor. As disclosed, a single monitor may accommodate several formats or plural monitors can operate selectively for concurrent multiple displays.

A sequence of scheduled appointments may be developed, as programmed, along with intervals of video communication. A record of the scheduled appointments is maintained by the central traffic control system.

At the appropriate times, identification designations for remote locations are provided in sequence, to address a memory for fetching telephone numbers and/or graphic display data also recorded when the appointments are scheduled. Accordingly, in sequence, vendor, surveillance or like locations are dialed up via the public telephone system, either manually or automatically, to obtain audio-video communication providing an image of the vendor and the surrounding area at a specific vendor location. Additionally, data associated with a vendor (or a buyer) may be graphically displayed for convenient reference. For each scene display with respect to a specific vendor, the graphic display of pertinent data provided may, for example, indicate the telephone number, the PIN number, the video format, vendor rating, current vendor delivery status and so on.

Special controls such as a mouse may be instituted enabling manifestations at the vendor location to initiate action or alter the display. Special operations also may be commanded through the videophone, video still (high quality) or high fidelity (hi-fi) video means either on manual initiative or automatically by automatic apparatus.

A video recorder and/or video printer may be located at a remote vendor location, central traffic control station or buyer location for selectively or continuously obtaining a video recording or video printout of displays.

Multiple coordinated central traffic control stations may be employed to communicate with widely distributed vendor or buyer locations with capabilities to route calls to each other, in the event that all of the communication lines are occupied and there is a considerable backlog of calls. Calls may be routed to the next available operator (buyer), for example, in the event appointments scheduled for a particular buyer last longer than contemplated, or another buyer familiar with that line of products may step in and handle the appointment.

Under some circumstances it may be desirable to prioritize calls. For example, appointments may be queued in sequence, specific appointments may precede other routed appointments in accordance with an override feature.

A record of the number of calls and related charges incurred by the buyers for appointments is maintained, which may be analyzed and ultimately rebilled to the vendors. Of course, charges for scheduling are incurred directly by the vendors. Also, a record of charges incurred for each caller (buyer or vendor), depending upon the transaction initiated, may be maintained and billed to each caller.

A video recorder and/or printer may be located at a remote location or central unit for selectively or continuously obtaining a video recording or computer printout of displays.

Multiple control units may be employed to monitor widely distributed locations with capabilities to route calls to each other in the event all the communication lines are occupied and there is a considerable backlog of calls, which may also be prioritized.

These, as well as other features of the present system will become apparent from the detailed description which follows, considered together with the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

A complete understanding of the invention and its advantages may be gained from a consideration of the following description of the disclosed embodiments taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a high-level block diagram of one embodiment of the system in accordance with the present invention accommodating monitoring capabilities;

FIGURE 2 is a more detailed block and pictorial diagram of another embodiment of the system of the present invention accommodating scheduling and processing and commercial product routing and vending capabilities;

FIGURE 3 is a more detailed block diagram of basic components in the system of FIGURE 2 illustrating an exemplary configuration thereof;

FIGURE 4 is a fragmentary diagrammatic representation of an exemplary storage cell for information specific to a vendor, as may be formatted in the system of FIGURE 2;

FIGURE 5 is a fragmentary diagrammatic representation of an exemplary storage cell for information specific to a buyer, as may be formatted in the system of FIGURE 2;

FIGURE 6 is a logic diagram illustrating an exemplary operation format of the system of FIGURE 2 for automated execution initiation of scheduled appointments;

FIGURE 7 is a logic diagram illustrating an exemplary operation format of the system of FIGURE 2 for scheduling appointments;

FIGURE 8 is a detailed block diagram illustrating an exemplary configuration of the basic components of the central traffic control system of FIGURE 2;

FIGURE 9 is a logic flow diagram illustrating an exemplary operation format of the system of FIGURE 8 for automated qualification of callers, such as vendors or buyers;

FIGURE 10 is an exemplary form for use in the embodiment of FIGURE 2 indicating a buyer's request; and

FIGURE 11 is an exemplary message for use in the embodiment of FIGURE 2 transmitted from the central traffic station to a buyer or a vendor.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As indicated above, a significant aspect of the system of the present invention is based on recognizing that a dial-up public telephone system may be effectively utilized for visual communication and/or conferences between a plurality of remote locations and a central station. More specifically, it has been recognized that for effective security or surveillance capabilities, scheduling and processing capabilities or product routing and vending

capabilities, dial-up voice quality lines, such as standard analog or digital lines, may be employed variously in conjunction with videophone equipment, computer facilities (personal computers (PCs) with video capabilities), sensing apparatus and various forms of telephonic equipment as voice generators, auto dialers and D-channel or in-band signalling apparatus.

To that end, a dial-up public telephone system TS is illustrated in FIGURE 1 (upper center) affording effective communication between a plurality of remote locations L1-Ln and at least one central unit CS.

In accordance with one embodiment, the remote locations L1-Ln may involve a wide variety of locations, such as for surveillance, for example, markets such as grocery chains and convenience stores, banks, warehouses, residences, automatic tellers, restaurants, factories, plants, businesses, parking structures and so on. The location L1-Ln may alternatively represent specific vendor sites and the central unit may be located either at a specific buyer facility (including a plurality of communication and control stations for one or more operators, for example, buyers), or at different locations, some being remote from a buyer facility.

Essentially, each location L1-Ln is equipped with at least one videophone capability (described below) to provide telephonic signals through the telephone system TS to accomplish a display at the central unit or station CS. Along with video signal display, under manual or computer control, audio and data signals are employed to supplement and enhance communication and monitoring operations. In that regard, each of the locations L1-Ln may incorporate several video speakerphones (with one-way and two-way communication and echo canceling), cameras (in some cases, separate cameras may be used to concurrently provide images for a videophone and high quality still images), sensors, switches, automatic dialing devices and computer memory capability for initiating and responding to commands from

the central unit CS, as well as initiating various actions to accomplish change or to accommodate special circumstances.

The central unit CS incorporates a telephonic interface, control and sequence-switching computer 12 coupled to a plurality of operator terminals V1-Vn. In one example, each of the operator terminals V1-Vn is a videophone monitor station. Accordingly, in one format, during routine operation, the videophone stations V1-Vn simply provide a sequence of combined audio, scene and graphic displays revealing situations (under surveillance) or particular vendors and their surrounding area where goods may be displayed at identified remote locations L1-Ln.

In one application, with the event of special circumstances, one or more of the videophone stations V1-Vn is initially dedicated to monitoring and communicating with one or more of the locations L1-Ln experiencing a special situation.

The videophone terminals may be supplemented, as for an emergency. Specifically, cellular telephone capability may be provided for independent communication. As indicated below, such capability also may be important at locations L1-Ln.

As suggested above, a special situation, (e.g., "emergency" or "alert") is initiated either from the central unit CS or any one of the remote locations L1-Ln. Essentially, in response to a location-sensed special situation, dial-up operations are initiated to accomplish a "special situation" connection from one or more of the videophone stations V1-Vn so as to monitor and potentially affect the situation at one of the surveillance locations L1-Ln.

Furthermore, the central unit CS may automatically place an emergency call (for example, to indicate armed robbery in progress) to the appropriate police department, determined by a database associated with the particular one of the locations L1-Ln at which the incident is occurring,

for example, by using ANI as described below. In the interim, the operator may describe the situation to the dispatcher at the police department or may be connected directly to the responding patrol car. Alternatively, the operator may actuate an auto dialer, such that the auto dialer code number (obtained from the central unit database) displayed on the operator's video terminal connects him or her to the appropriate police department. In the event there are complications, the operator may use a regular telephone or a cellular telephone and manually dial the telephone number displayed on the video terminal.

Preliminarily, considering an exemplary sequence of operations with reference to FIGURE 1, assume that the location L1, a bank, is entered by a person carrying a gun with an intent to commit robbery. At some point, as described in detail below, the intention of the person may become known and manifest by a command signal, variously generated at the location L1. As a result, telephone equipment at the location L1 is actuated, prompting dial-up operations to accomplish a connection from the bank location L1 through the telephone system TS and the computer 12 to one of the videophone stations V1-Vn. Assume, for example, that the videophone station V1 is involved. As described in detail below, in such a situation, the called number to the computer 12 (originated by the location L1) indicates the nature of the special situation, e.g., "emergency" or "alert". That is, the nature of the situation is indicated by dialed number identification signals (DNIS) using a capability readily available from the telephone system TS, as for example, on the so-called D-channel. The dialed number identification signals (DNIS) may likewise indicate the type of location where the special situation is occurring, for example, where certain monitors at the central unit CS are dedicated only to supermarkets and others only to banks or the like.

It is to be noted that while the D-channel provides one operational configuration, some DNIS and/or ANI (Automatic

Number Identification) data signals can be received in-band without D-channel apparatus. In any event, DNIS signals indicate the called number from the bank location L1. With the provided data (e.g. using DNIS for situation, ANI for identification) the computer 12 fetches identification data for a graphic display at the videophone station V1. Thus, the videophone station V1 displays a video scene within the bank location L1 along with graphic data, for example, to indicate: the nature of the special situation, e.g. "alert" or "emergency", the location, key personnel and so on. Of course, image enhancing techniques, as associated with current videophone technology for enlarging the signals received at the central unit CS or to provide higher resolution pictures may be utilized. Accordingly, large monitors may be utilized at the central station for viewing such enhanced images.

Alternately, personnel at the remote location under surveillance may call a predetermined telephone number for the central unit CS, whereby as disclosed below, the use of ARU (FIGURE 2) interactive technology including voice generators can prompt entry by touch tone of remote location code number or predetermined situation codes (with DNIS). For example, personnel from the remote location may be given voice prompts, either live or prerecorded, for example, "Please enter your remote location code followed by the situation code, 1 for emergency or 2 for alert."

By using dedicated communication lines to remote locations L1-Ln, telephones at the remote locations may be configured to answer after a predetermined number of rings, e.g., three rings. Thus, regular polling of the remote locations L1-Ln at selected or random times during the day determines if the line is operational. In the event the line is busy or out of order, an "alert" situation may be communicated to the central unit CS whereby the police may be summoned to investigate the situation at that particular location Ln. Alternately, to save telephone expenses and avoid billing, the central unit CS may initiate a call to

determine if a line is operative, but, terminate the call upon making the determination during the initial stage that the situation is normal. For example, the system may terminate a call after two rings rather than wait from an answer at three rings. Also, detectors located at the remote locations L1-Ln could indicate an "alert" situation to the central unit CS, for example, in the event a lens has been deliberately covered to prevent scrutiny.

Alternatively, remote locations may provide distinctive or unique audio tones recognized by the central units CS in the event fraudulent replacement of telephones or the like to simulate a normal situation is contemplated by offenders.

As another feature, an incoming line can be designated at the central unit CS, as an 800 line to receive calls from any telephone to prompt scrutiny. For example, a call on the line may be answered by an interface or an operator to be notified to establish scrutiny at a specified location. In that regard, the location might be specified by ANI signals. Accordingly, a person at a surveillance location who becomes aware of a potential danger can simply call the designated number from any telephone to instigate scrutiny.

At the central unit CS, the emergency display continues with the system implementing manual controls as disclosed in detail below. For example, the status of the situation can be altered, various cameras at the location L1 may be selected, scenes may be modified and audio or video may be controlled. Note that the cameras may be of various kinds, for example, wireless, panning, zoom and so on. Also, the cameras may be operated to modify scenes by panning, zooming, tilting or providing freeze frames, as desired. Furthermore, a record (VCR) may be made of all received signals as for subsequent study. Note also that by assigning each of the locations L1-Ln, a distinct DNIS (called number) identification data in the memory can be accessed accurately by the DNIS number if desired.

At the central unit CS, multiple operators at single monitors may be utilized, with calls sequenced to each

operator depending upon the cumulative handling capability of each operator. For example, if a particular operator is handling calls at the average rate of six seconds each, calls to that operator will be sequenced at that rate. Furthermore, selective distribution of calls may be appropriate, for example, calls reporting "emergency" situations may be forwarded to a particular operator trained in emergency procedures. Alternatively, calls may be routed to the next available operator. In addition, as the calls are queued in sequence, calls reporting "emergency" or "alert" situations may precede other routing calls in accordance with an override feature.

A suitable layout of video cameras along with sensors and switches may be employed to indicate situations in a bank. The individual cameras, switches and sensors (including manual switches) may take a multitude of forms. For example, the sensors might be sonic, infrared, visible light, metal detectors, and so on.

In the context of an ATM site, motion detectors may be utilized to detect approaching individuals, whereby the motion detector upon detecting an individual initiates contact with the central unit CS for viewing. Alternately, entry of a PIN (personal identification number) by an ATM customer may likewise initiate contact. It is also contemplated that initiating contact with the central unit CS could be controlled by the clock, such that the central unit CS may be configured only to receive calls at select intervals of time, for example, between 7 p.m. and 12 a.m. Additionally, the system may be configured such that DNIS and ANI communication features cross reference with the clock prior to answering. For example, if the present time is between 5 p.m. and 10 p.m., select calls are not accepted. Such operation may or may not be useful in various applications of the present system.

Referring now to FIGURE 2, in accordance with an alternative embodiment, locations L1-Ln may represent remote vendor sites. For merchandising applications, the central

unit CS (FIGURE 1) is embodied as a traffic control system TIS which schedules and processes appointments, and regulates communication between plural groups. The remote specific vendor locations communicate with the central traffic control system TIS which may be located remote from the buyers' and vendors' facilities.

As a buyer example, XYZ Drug Company (a large chain) may employ individual merchandise buyers responsible for purchasing specific categories or sub-categories of items. For example, one buyer (person) may be responsible for purchasing body treatment products, such as skin and hair products, another buyer may be responsible for purchasing vitamins and over the counter medications, and yet another for purchasing magazines and toys, and so on. The present system facilitates selective transmission of communications between individual buyers of plural buyer groups or sub-groups and qualified members of plural vendor groups or sub-groups. For example, special offerings by vendors for particular merchandise may be transmitted only to buyers designated for purchase of the merchandise. Likewise, buyer requests for proposals on select merchandise are transmitted only to vendors designated to sell the merchandise. Similarly, appointments for conferences may be scheduled by vendors or buyers, although in keeping with present merchandising practices, it is generally contemplated that vendors would pursue scheduled appointments. However, appointments are generally verified by buyers and appointment execution calls are generally initiated by buyers, either directly or automatically using auto dialers.

A fully automated interactive voice response system including ARUs (audio response units) may schedule appointments for specific buyers and subsequently, load schedules for all the buyers into a memory at the central traffic control station. Alternatively, each specific buyer's schedule may be transmitted to and loaded into a memory at each buyer terminal. In some instances, vendors may communicate with the traffic control station in any of a

variety of ways (touch-tone, electronic-mail, voice-mail, facsimile or the like) to make and/or verify appointments and/or initiate the conferences, if necessary. In addition, buyers may also communicate with the traffic control system to approve appointments, or otherwise update information in any of a variety of ways (touch-tone, electronic-mail, voice-mail, facsimile or the like). During visual conferences (in real-time), vendors may display their goods, packaging or promotional displays and otherwise effectively communicate with the buyers.

Along with a video signal display (real-time, color, motion, freeze frame), under manual or computer control, audio and data signals are employed to supplement and enhance conferencing operations. In an exemplary system, each of the vendor locations may incorporate several video speakerphones (with one-way and two-way communication and echo canceling), a camera (separate cameras also may be used to concurrently provide images for a videophone and high quality still images), switches, automatic dialing devices and computer memory capability for initiating and responding to commands from the central traffic control system, as well as for initiating various actions to accomplish change or to accommodate special circumstances.

Conventionally, in merchandising applications, it is appropriate for the vendors to incur communication expenses. To facilitate this, a reduced rate service for long distance outbound calling, for example, MEGACOM, may be installed at each of the buyers' facilities. Data on calls made by the buyers may be obtained from the telephone company (e.g., AT&T telephone company) and analyzed to isolate calls made to each specific vendor and thus, the cumulative charges incurred may be computed. For example, outgoing call activity may be monitored at each of the buyers' facilities or the independently managed, central traffic control site and rebilled to specific vendors.

Alternatively, toll free or "800" services at each of the vendor locations may be installed, and "800" number

calls initiated by the buyers may be billed to each of the vendor locations. Further, the central traffic control system may include a central detail service to contract for and install telephone services at both the buyer and vendor locations, in order to obtain and report on calls to and from the buyers, as well as centrally bill both buyers and vendors for all video telephone communications and related transactions.

Considerable other data may be developed and stored. For example, the central traffic control station for each buyer facility may maintain a record of outbound calls made by all the buyers located at that facility including data, such as the date and time of the call, the name of the buyer initiating the call and the duration of the call. Accordingly, information for each buyer may be subsequently compiled. Likewise, the central traffic control station may maintain a record of all the calls made by each vendor. For example, a specific organization may wish to ascertain the number of vendor calls to a particular buyer. Accordingly, the central traffic control station may compile such data by comparing vendor outbound calls with a database of buyers (including information, such as telephone numbers, names etc.).

Furthermore, in some cases, a summary of each buyer's efficiency may be recorded and provided to interested parties. For example, a buyer's efficiency may be ascertained by the number of video calls made by a specific buyer every week, the average length of the video call, and other data displayed from the database, namely, name of the vendor, names of the persons participating in the call, and so on. For example, for a particular buyer a summary could indicate that during the week of March 20, 1993, forty calls were made for an average length of twenty minutes. Detailed information may further indicate that specifically at 10:00 a.m., on March 20, 1993, a first appointment with Mr. John Blow, of ABC Fruit Company was initiated, which lasted for 1 hour and 12 minutes, and at 11:12 a.m., a second appointment

with Ms. Mary Smith of XYZ Cutlery Company lasted 11 minutes and so on.

The central traffic control system TIS may automatically place a call (for example, to broadcast a proposal request from a buyer) to the appropriate vendor locations, determined by a database of vendor locations qualified (for example, as by specific category or sub-category) for the particular merchandise for which the buyer requests proposals. Likewise, when executing appointments, the buyer may place a call to the appropriate vendor location, determined also by a database associated with the particular one of the vendor locations L1-Ln, with which the specific buyer has an appointment scheduled. Alternatively, the buyer may actuate an auto dialer, such that the auto dialer code number (obtained from the central traffic control station database) displayed on the buyer's video terminal connects him or her to the appropriate vendor. In the event there are complications or otherwise, the buyer may use a regular telephone or a cellular telephone and manually dial the telephone number displayed on the video terminal. It is currently recognized that cellular transmission will ultimately provide dynamic motion and high resolutions freeze frame displays.

The operation of the total-system embodiment of FIGURE 2 will now be considered in somewhat greater detail. Preliminarily, it should also be recognized that certain basic components illustrated only at the central traffic control site TIS, such as memory, data storage, auto dialers, printers, VCRs etc., obviously may also be found at the buyer sites.

In the illustrated embodiment, the central traffic control system TIS directs and exchanges on-line and off-line traffic between the vendor and buyer sites, in the form of special offerings, proposals etc., as well as accepts appointment requests from either the vendor or the buyer sites. Appointment requests are generally initiated from the vendor locations L1-Ln. Subsequently, buyers initiate

communication with specific vendors in accordance with scheduled appointments at the appropriate times.

The central traffic control system TIS may initiate contact with the vendor locations L1-Ln or the buyer locations V1-Vn (in predetermined sequence or randomly) to afford communication with the designated vendor or buyer. For visual conferences, buyers may initiate contact with the appropriate vendor locations L1-Ln, also in sequence, such as when scheduled, or in some instances randomly.

As illustrated in FIGURE 2, different vendor locations may have different communication capabilities, as represented by terminals VP1, VS1 for analog telephone communication capabilities over standard analog lines (static, videophone or PC), terminal VD1 for digital video capabilities over ISDN lines, and CDP1 for a combined terminal for analog and digital communication capabilities. For illustration purposes, FIGURE 2 shows one telephone (see CDP1) as exhibiting both analog and digital communication capabilities.

The videophone terminal VP1 may be a unit available from AT&T, such as the Videophone 2500, or one available from MCI. A form of the digital video system VD1, for example, the NCR PVS-70 system also is available from AT&T/NCR and is recognized to provide high quality images. A static video system VS1 may be AT&T's PICASSO™ still image phone, which transmits "picture perfect" still color images and voice simultaneously in just a matter of seconds. By pushing a button on the PICASSO™ phone, a still image for a camcorder or electronic camera may be captured and, by pushing another button, that picture may be transmitted to another PICASSO™ phone. Such a video static system connects to standard analog telephone lines and is compatible with a wide range of video technology used in daily communication and industry standard camcorders, electronic cameras, mouse devices, document scanners and photo CD players. Accordingly, full-color images, virtually of any type, size or dimension may be transmitted for display on a TV, LCD

panel, PC monitor or video monitor. Images may be stored or printed using a PC interface.

FIGURE 2 also illustrates representative operator terminals V1-Vn (in this embodiment manned by buyers), coupled to the traffic control system TIS. Of course, all the operator terminals, as well as the central traffic control system may be compatibly configured. Note that different videophone systems, rely on their own proprietary codecs, sometimes with more than one as an option. Generally, the operator terminals have the capability to accommodate videophone operation along with telephone switching and a variety of control functions.

The central traffic control system TIS includes a computer control and interface system 28 coupled to several operating devices including an auto dialer 30, a memory 32, a "D" channel signal processor 34, an audio response unit (ARU) 36 and a caller test unit 38. These structures and their interconnections are disclosed in greater detail below.

The computer control and interface system 28 also is connected to a clock 40 and an operator station 42. The clock 40 may control scheduling operations as explained above. For example, updates or changes to appointments, such as cancellations, may be remotely implemented (for example, via the central traffic control system) and forwarded to the appropriate buyer in a variety of ways, such as facsimile, electronic-mail, voice-mail or the like. The clock 40 may likewise monitor time limitations, as when special offerings and proposals are only valid for defined intervals of time.

With the live operator station 42, calls from vendors seeking appointments, making special offerings, or alternatively, calls from buyers seeking appointments or proposals, may be transferred to a human operator, in the event there are complications with the automatic response units or message recording equipment or in the event callers are calling from a rotary telephone. Some vendors or buyers

may always prefer telephone communication with a human operator at some level.

As indicated above, flexibility to accommodate various vendor equipment configurations is an important aspect of the central traffic control system TIS and the operator terminals V1-Vn. In that regard, it should be recognized that even though only the buyer operator terminals V1-Vn are shown coupled to a format switch 41 (lower center), the central traffic control system TIS also has some form of a format switch, shown as part of the video file server. The format switch 41 (FIGURE 2) selects a compatible one of analog video circuits and static video circuits (on analog communication lines) and digital video circuits (on digital communication lines) for driving one or more monitors incorporating such specific circuits. Each of the video monitors V1-Vn carry a camera C1-Cn, which may variously facilitate dynamic motion images and still images. The format switch unit 41 (FIGURE 2) can switch a single analog line 39 (from analog lines AL1-ALn) to couple to either videophone circuits or static video circuits or a digital line (or lines from digital lines DL1-DLn) indicated at 39a to couple to digital video circuits. Note that two lines are typically required for digital video, one for audio and one for digital data. Alternatively, the audio line may also serve as the analog line.

A video recorder (VCR) also may be provided in all embodiments, indicated generally at 51a, which may be set to record continuously or intermittently, to provide historical data for subsequent reference, for example, of situations under surveillance or of vendor displays when conferring with a supervisor or refreshing the memory with respect to specific features. Alternatively, a video printer, also indicated at 51a, may be used. On receiving a request command, for example, from the central station CS or the traffic control system TIS, the video recorder may record compressed video signals of the display images. Of course,

continuous recording by the video recorder may be suspended when desired.

At locations where more than one camera is positioned, a single video recorder may be connected to the multiple cameras via a switching device to control and sequence the recordings from the cameras. A switching device such as the intelligent sequential switcher manufactured by SONY, as Model No. YS-S100, may be used to control and sequence multiple recordings. In addition, plural video recorders, such as separate video recorders for recording images transmitted on digital or analog lines may be connected.

In some situations, select frozen frames of viewings of situations under surveillance or of vendor products, or a specific time period of each viewing, may be recorded on a VCR or printed using a video printer, for example, two seconds (specific time period) of a twenty minute appointment for each location under surveillance or vendor location. Such video printing may be obtained by the central location CS or both by buyers and vendors.

Likewise, the operator terminal V1 (or the remote locations L1-Ln or the central unit CS or the central traffic control system TIS), for example, may incorporate a standard line printer for providing a printed record of predetermined communications, e.g., indicating the date, time, location, period of viewing etc. Thus, a detailed hard-copy record is available when desired.

With respect to some embodiments, such as for merchandising, the traffic control system TIS also includes within a memory 32 or separate therefrom, a video EDI 35 for storing EDI software (Electronic Data Interchange facilitating direct computer-to-computer exchange of forms) or the like. It should be recognized that the buyer terminals V1-Vn may also have EDI software or the like stored in memory, by virtue of which, easy access to and exchange of forms is facilitated. The traffic control system TIS also includes a video file server 37, where vendors and buyers may deposit a video recording of a

product being offered by a vendor or alternatively, desired by a buyer. A block indicated at 45 and labeled "data storage" stores standard system and network software. Selectivity logic, indicated at 47, to prevent information overload selectively directs communications between members of plural groups or sub-groups, such as wholesale buyer and vendor groups. Operations relating to the selectivity logic 47 are discussed below.

At this stage, consider an initial phase of a vendor scheduling an appointment. In that regard, select vendors are given advance notice of calling numbers and operating instructions. Accordingly, consider an exemplary operation sequence from the vendor telephone AT1 (FIGURE 2). Thus, the vendor initiates dial-up operation with the central system TIS, seeking to schedule an appointment with the specific buyer. With a connection, a called number is indicated by Dialed Number Identification Signals (DNIS) utilizing facilities readily available and provided by the dial-up telephone system TS through the so-called D-channel apparatus 34. Thus, the central traffic control system TIS has a basis for determining if, by reason of dialing the called number, the vendor is entitled to make an appointment with a specified buyer. A PIN number entered by the vendor may also qualify a caller (vendor).

The dial-up telephone system TS also provides Automatic Number Identification (ANI) signals indicating the calling number on the so-called D-channel apparatus 34. In various operational phases of the present disclosed embodiment, such signals identify the remote vendor location L1 to the central traffic control system TIS. Using such information, the memory 32 may provide alternate forms of calling signals, commanding a specific outgoing line from the telephone computer control and interface 28 to afford additional communication. Specifically, for example, ANI signals might command various related data from the memory 32. Thus, an appointment may be scheduled for execution at a later time as explained in detail below.

As an alternative to simply scheduling an appointment, assume that the caller is located at the buyer terminal VP1 and wishes to initiate video contact with a specific buyer. Upon attaining communication, the call may be processed, for example, directly to the buyer terminal V1, at which appropriate videophone communication is provided with the vendor. In that regard, video monitors at the terminals V1-Vn may be compatible to receive videophone signals through the dial-up telephone system TS and the computer control and interface 28 of the traffic control system TIS.

Whether a conference is implemented as a result of a direct call from a vendor, or as a result of a scheduled appointment, in accordance with the present development, the selected operator terminal V1-Vn (buyer terminal) is formatted in a configuration compatible with the connected vendor terminal. In that regard, the terminal AT1 (vendor) simply accommodates audio and digital signals and is representative of such terminals for use to schedule appointments, as in an ARU interface. Alternatively, person-to-person communication is available through the operator station 42.

The videophone terminal VP1 is representative of such units to provide one form of audio/video communication with one of the terminals V1-Vn. During such communication, the format switch 41 is actuated to activate the videophone circuits to function in cooperation with one of the monitors V1 or Vn. Thus, compatible communication is implemented for each outgoing call, utilizing data from the memory 32.

For communication with static video systems (PICASSO™ units) as represented by the terminal VS1, the format switch 41 actuates the static video circuits for compatible operation of a monitor V1 or Vn. Note that particularly effective operations may involve combination formats, for example, a videophone and a static video system (likely using a single analog line). Specifically, with both of the appropriate circuits operative, the camera and the monitor V1 may function in a videophone format to accommodate

effective personal communication between a buyer and a seller. Concurrently, the camera and the monitor V1 may operate in a static video format to effectively exhibit a vendor's product. Additionally, a mouse 51 at the terminal VS1, controls a cursor in the display of the monitor V1 further enhancing interactive communication. A mouse, such as the one indicated at 51 may also be provided at the buyer terminals V1-Vn. Again, the format switch 41 controls the operations to attain the compatible format.

To further illustrate the possibilities, the terminal VD1 is representative of high fidelity (hi-fi) telephonic video systems using digital lines for higher resolution dynamic displays. As with respect to the other formats, the format switch 41 selectively actuates the compatible circuits, the digital video circuits, to drive a selected combination of camera and monitor.

It may be seen that the video platforms of terminals V1-Vn offer considerable flexibility in accommodating multiple audio-video formats. Convenience is served by the multiple format capability of the camera along with the video monitor V1-Vn.

Recapitulating, the terminal V1 has been described for communication with the various equipments at locations to include a video location for display. In addition to the display, each of the terminals V1-Vn incorporates a handpiece or equivalent, and a substantial control panel that may be in the form of a telephone pad or embodied as part of a personal computer keyboard. In any event, the control panel for each terminal V1-Vn includes the current controls for an operative video format, plus dedicated controls relating to the disclosed system.

One form of control involves video coordination. For example, in accordance with a program, a conference might be initiated in a videophone format with the terminal V1 (FIGURE 2). Accordingly, the videophone circuits are active to drive the video monitor V1. At some point, assume the conference participants decide to add a static video

communication. An appropriate command in touch tones on the key pad initiates a series of operations. Specifically, another line connection is established by actuating the auto dialer 30 (FIGURE 2), then static video circuits are actuated. At the terminal V1, the static video circuits are actuated to drive the monitor V1 that may involve another monitor or split image operation. Separate displays for dynamic and still video may be used, such that a buyer at one monitor can confer with a vendor, speaking face-to-face through the camera and that monitor, while the vendor exhibits fine details of a product on a second monitor in a still image. Of course, in sequences of such still images, views can be changed and areas highlighted with a cursor controlled by the mouse 51.

As an alternative to actuating the static video format, the conferees may elect to go digital. A suitable command from the key pad sets the requisite steps in motion. The auto dialer 30 dials up a digital connection, then using that connection, the format switch 41 actuates the digital video circuits to drive one of the monitors V1-Vn. Note that with enhanced hi-fi video communication, the assumed videophone communication might best be terminated.

In view of these examples, it will be apparent that the operator at the terminal V1 has substantial control, including the ability to go from one video format to another. Of course, such operations presume that the vendor has the requisite capacity, which may be indicated in the graphic display as treated in greater detail below.

From the above descriptions, it is apparent that the disclosed system utilizes videophone technology in combination with other telephone system technology along with computer control and graphics technology to accomplish effective scheduling and processing of traffic for visual conferences.

As explained above, the exemplary central traffic control system TIS functions to initiate outgoing calls, as well as receive and process incoming calls. To resume with

the explanation of an incoming call from a vendor to schedule an appointment, when the telephone computer control and interface 28 (FIGURE 2) receives an incoming call, it may be connected to either the operator station 42 or the audio response unit 36. Concurrently, incoming data signals (DNIS and ANI) are provided to the "D" channel processor 34 for control and/or information. For example, from the memory 32, the computer control and interface 28 may fetch the identification of the vendor location L1 embracing one or more of the terminals VD1, etc. With such signal represented data, one or more buyers are identified with whom the vendor or vendor organization is entitled to schedule an appointment. However, to schedule an appointment, a vendor may use virtually any form of telephone instrument or terminal including any of the units AT1, VP1, VS1, VD1 or CDP1 as illustrated in FIGURE 2. The unit AT1 is sufficient either for a telephonic-computer interactive call or a direct operator call (station 42) to schedule an appointment or the like.

Initially, as described above, inbound calls for a buyer, initiated by vendors, may be received through the computer control and interface 28 (FIGURE 2, upper right) for scheduling appointments or directly accommodated at a buyer location by the interface telephone switch SW (FIGURE 1, center left) including the format switch 41 for visual conferences. The format switch 41 may incorporate a variable codec for analog lines AL1-ALN and digital lines DL1-DLN. For analog lines, a video CODEC along with computing capability may take the form of an AVP1000 video CODEC chip set as available from AT&T. Essentially, the CODEC chip set accomplishes videophone operation and consists of a video encoder, a video decoder and an internal system controller. The format switch unit 41 is shown as coupled between a standard analog line and a line on ISDN. Upon receiving a call from a videophone unit, the format switch unit 41 selects the appropriate line, that is, the analog line. Alternatively, upon receiving a call from a

high fidelity video (digital), the format switch unit 41 selects a digital line. Also, as described above, during visual communication (real-time), a buyer may make switches, e.g., from transmitting dynamic images over a single analog line to high resolution freeze frames. The high resolution freeze frames may be viewed on large 14 inch monitors. Further, the images may be manipulated from either end, to view the freeze frame image concurrently.

In the operation of the system embracing the exemplary formats as treated above and below, a record is made for billing purposes. That is, the terminal 14 (FIGURE 1) embodied as a billing memory unit and a standard printer (treated below) are controlled by the computer control and interface 28 to record all transactions in relation to billing charges. Such data can be variously processed at different times. Basically, the concept involves formulating billing data, so that at least a part of the calls made to a vendor, for example, can be rebilled to that vendor.

Considering the dial-up telephone system TS (FIGURE 2) in somewhat greater detail, in arrangement, the inter-exchange carrier (e.g., AT&T) provides comprehensive data on calls specifying: phone number calling, phone number called, date, time, length of call (period), billing data and so on. Test or look-up operations are then performed with reference to a vendor database. Accordingly, portions of the charges (with or without mark-ups) are rebilled (with appropriate identification to the vendors). Such operations may be particularly effective in relation to "private" networks, e.g., the so-called SDN (software defined network), SDDN (software defined data network) which is compatible with ISDN operations, or a combination of the two service offerings (SDN with SDDN). Note that AT&T's SDN is a virtual network service which offers an organization the ability to build a private corporate network within the AT&T public network. A customized database contains information on various sites affiliated with the organization (i.e., the

service organization installs a "private" network service at many different business entities), as well as features and routing information. Moreover, SDN encompasses voice, analog data, digital data and image transfer. SDDN is a feature of SDN and is most often installed in conjunction with SDN. A combination of the two provides the capability of combining all the different sites for network management and billing. Note that both buyers and vendors may wish to extend the scope of the network of participants by installing at least one similar mode of video in their branches, plants and/or customers.

Essentially, coordinated with the computer control and interface 28 in the system TIS, reapportioning and rebilling options are executed by the billing data unit utilizing storage capacity of the memory 32 or a separate billing data memory 49 (FIGURE 3).

To this point, detailed consideration has been primarily directed to the treatment of incoming calls to the system TIS. However, as explained, certain modes involve the placement of outgoing calls under either manual control or automatic operation. Such operations next are treated in detail.

As a result of control operations, to implement a sequence of scheduled conferences, the computer control and interface 28 (FIGURE 2) at the central traffic control site TIS or the control computer 44 at the buyer site V1-Vn (FIGURE 1) may address, for example, the memory 32 to fetch the telephone number for an outgoing call, e.g., a vendor location L1. The telephone number is supplied from the memory 32 (or a memory at the buyer location) to the control computer 44 which actuates an auto dialer, similar to auto dialer 30, to provide the dial-up signals on an off-hook line provided to the dial-up telephone system TS. Typically, at the vendor location L1, a dedicated or other line for video operations will accept the communication.

As an alternative to manual calls, the system may operate under computer control to enable a sequence of

appointments. During the operation, the control computer 44 fetches telephone numbers for remote locations from the memory 32 (or a memory on site) in sequence, actuates the auto dialer 34 accordingly, and assigns the resulting connections as scheduled. After a session between a particular buyer and vendor has concluded, the control computer 44 terminates the connection in favor of the next waiting connection. A blinking light or alternatively, a graphic display of "Five more minutes for the next appointment" may be exhibited to the caller to indicate a next appointment. The operation may result in sequential displays that have been scheduled at the particular one of the terminals V1-Vn.

Different selling and buying companies may be registered with the central traffic control system TIS. At registration, central traffic control system TIS may issue an identification card with a check digit for qualification to each representative of the selling or buying company. For example, assume that XYZ company has four vendor representatives, all located at vendor location L1 equipped with analog capabilities only. Further assume that the telephone number for that location is (212) 555-5555. Accordingly, the traffic control system TIS may assign a identification number and store the following information under that identification number in memory: Jones, Roger, XYZ Toy Company, Analog System, Telephone number (212) 555-5555, Registered to interact with EFG Company (central station number - (310) 666-6666), no priority, IJK Company (central station number - (414) 777-7777), priority with buyer no. 3, Thursday appointments may be offered to vendors with priority status. At registration, each vendor and buyer fills out a subscription form or otherwise provides the central traffic control system TIS with specific information, such as the nature of the merchandise they are designated to sell or buy. This information may be provided with reference to an established list of merchandise codes (FIGURES 4 and 5). The designated merchandise codes assist

the selectivity logic 47 in making routing determinations to avoid information overload. Similarly, vendors and buyers seeking appointments are qualified on the basis of these merchandise codes and limited to making appointments only with authorized persons.

To make an appointment, a special offering or a proposal in response to a buyer request, the vendor may initiate dial-up operations with the central traffic control system TIS. For such calls, the ARU 36 may provide voice cues to the vendor and prompt touch tone input of responses as described above. A single ARU may be used for different organizations, alternatively, different ARU's may be used for different large organizations. The ARU's may include voice-mail capabilities for individual buyers. After recording all the information pertaining to a special offering or proposal, the central traffic control system TIS provides reservation or identification numbers. For example, callers may be queried via the ARU if calling to cancel an appointment or supplement a special offering or proposal. If a call is merely to cancel an appointment, the vendor would only need to enter the appointment number. Likewise, if the call is simply to report that a sale for a special offering has been consummated, the vendor may only need to enter an identification number.

Note that live operators also may take information from vendors and access the traffic control system TIS to enter appropriate request data processed similar to the automatic features of the system in the event vendors are calling from a rotary telephone or for other reasons. Additionally, the live operators may transfer calls to an ARU to enable vendors to leave voice-mail messages.

The traffic control system TIS may provide schedule or other data to individual buyers via facsimile, either automatically or upon request. Alternatively, schedule or other data may be provided to individual buyers by downloading data onto a computer at the buyer's location typically in batch mode overnight. Recent changes to

appointments or special offerings and proposals may be displayed on the buyer's terminal (real-time) or forwarded by electronic-mail.

At the central traffic control site, which may service numerous business entities, several audio response units (ARUs) may be used in conjunction with several groups of live operators. To accommodate large numbers of calls, automatic call distributors (ACD) may be utilized to route calls where the different business entities are identified by DNIS.

It should be recognized that video recordings on specific merchandise may be stored at the video file server 37 for viewing by buyers and sales may be consummated without any visual conferences between vendors and buyers.

Also, it should be recognized that the buyer terminals disclosed herein may be used by retailers to sell products directly to the persons having units similar to the vendor units described herein in their homes. In such a scenario, ANI may be used to identify a particular household calling, and DNIS may be used to identify a particular product of interest.

As indicated above, the traffic control system TIS incorporates structure for a wide variety of communications through the dial-up telephone system TS.

Referring now to FIGURE 3, each of the operator terminals V1-Vn (FIGURE 3, bottom) may be connected to a control unit, specifically, control computer 44 (center) that is inter-connected to an auto dialer 30, a memory 32 and a video audio recorder 51a (video and audio capability). Essentially, these units (and others) may be time shared by the video station or operator terminals V1-Vn. To that end, capability may be provided in the control computer 44 to transfer connections to locations L1-Ln as between the terminals V1-Vn. For example, operators (buyers) at the terminals V1-Vn may be specialists for certain goods with designated calls from specific vendors routed to specific

terminals and transfer capability to accommodate changes in situations.

Initially, as described above, inbound calls initiated by vendors or any remote telephonic interface appointment scheduling system (similar to the traffic control, FIGURE 2) are received through the telephonic interconnection 102 (FIGURE 3, upper left) accommodated by the interface telephone switch 43 as well known in the art. The information signals accompanying calls (ANI and DNIS) are passed to a D-channel circuit 104 as for decoding. That is, as indicated above, the calling number signals (ANI) identify the calling remote location. The called number signals (DNIS) may indicate the particular buyer, buyer organization etc.

Information carried by the ANI and DNIS signals is supplied from the circuit 104 (FIGURE 3) to the memory 32 (upper right) through the control computer 44. Specifically, a line 103 carries the information (DNIS) while a line 105 carries the call identification (ANI-Caller I.D.). Consider the ANI processing initially, specifically in relation to stored data as illustrated in FIGURE 4.

Referring now to FIGURE 7, with the initiation of a call, indicated at block 200, the central station receives "D" channel type signals, for example, including automatic number identification (ANI) for the calling number. Responsive to the ANI signals, the system fetches a cell from the memory 32 (FIGURE 3) for the execution of a preliminary routine by the audio response unit (ARU).

The illustrated operation continues at block 202, where after a greeting, the audio response unit 36 cues the caller, requesting a personal identification number (PIN number). The cues may simply take the form: "Please enter your personal identification number."

At query block 204, the PIN number entered by the caller is received in the control computer 44 for test by the unit 38. That is, the entered PIN number is compared with a stored PIN number (FIGURE 4, cell 70) to determine if

the PIN number is accurate and to confirm that the caller is authorized.

If the number is improper, indicated by a prompt "no" (FIGURE 7, block 204) the call may be terminated as indicated at block 206 or another opportunity may be afforded. Ultimately, the call may be terminated with a closing message or the call may be transferred to an operator.

With entry of a proper PIN number, operation continues at block 208, where authorized callers are next cued to identify the buyer with whom they wish to schedule an appointment. For example, the cue might simply take the form: "Enter the identification number for the buyer with whom you wish to schedule the appointment."

At query block 210, with the identification of the buyer, a computer check (FIGURE 3, test unit 38) determines the availability of the buyer to the caller as specified in the vendors cell 70 (FIGURE 4). If the caller is authorized to schedule appointments with the identified buyer, the interface proceeds under control of the computer 44, through a menu to schedule the time period desired for an appointment as indicated by block 212. For example, the caller (vendor) might be cued: "If you desire an appointment of 15 minutes, touch the pound key, if you desire an appointment of one half hour, touch the star key and if you truly believe one hour is required, touch the one key." Once the time period is specified, that information is stored in the memory 32 (FIGURES 2 & 3) as indicated by block 214. Specifically, the data is stored in a buyer cell 72 (FIGURE 5). In addition, priority status may be asserted as indicated by the vendor's PIN number. Note that the memory 32 also may store data as a basis for reports to buyers. Such reports may include comparisons, summaries, and analysis of exchange carriers call data and appointment scheduling files with associated vendor phone numbers.

The system may require qualification for vendors or schedule appointments of longer duration. For example, the

system may limit appointments of longer duration to select vendors. However, pursuing the appointment menu as indicated at block 216 (FIGURE 7), the interface may continue as by cuing the caller with a multiple choice of three appointment times from which one may be chosen.

At query block 218, a query is set forth to determine if the appointment is made. A prompt "no" terminates the call at block 206. A prompt "yes" stores the appointment time in the memory 32. Specifically, as indicated above, the appointment is stored in the buyer cell 72, as illustrated in FIGURE 5. The storage step is indicated at block 220 in FIGURE 7. With the appointment time and period or interval established, for example, May 12, 1992, 3.45 pm, the appointment is assigned a number at block 222. In that regard, generally vendor cells in the memory 32 may be accessed by appointment number, as well as the telephone number. Once the appointment number has been assigned, a caller may be cued for video format information, for example, to determine the caller's video format capabilities as indicated by block 224. Of course, if the video format data is already of record in the vendors cell (see FIGURE 4, vendor cell 70) the step may be deleted. Otherwise, the video format information is stored as indicated at block 226.

As indicated, the scheduling operations may be void of video communication, rather relying on computer interactive operations. Accordingly, the D-channel signals are operative primarily for identification and/or information. On the contrary, for video operation, data is addressed for supplemental graphics display. Specifically, from the control computer 44, the representative ANI signals address the memory 32 to fetch detailed graphic information, specifically, the identification data indicated generally as a buyers cell 72 as illustrated in FIGURE 5. A signal represented form of such data is supplied from the control computer 44 through one of a series of graphic lines G1-Gn to a selected one of the monitor stations V1-Vn.

Returning to FIGURE 3, within the station V1, the graphic identification signal data on a caller is received by a graphics generator 108 for processing into a video signal that is supplied to a video mixer 110. The output from the video mixer 110 drives a monitor 114 to provide a scene-graphics display.

As a concurrent operation with the ANI signal processing, the DNIS signal representation also is applied by the control computer 44 to the memory 32 for fetching an indication of the particular location (vendor). Signal representations of the vendor also are supplied from the control computer 44 to the graphics generator 108 and produce a display representation (see vendor data 70, FIGURE 4). Thus, the video mixer 110 receives comprehensive graphic signals for display concurrent with the picture scene representation, the signal source of which will now be considered.

As an alternative to the operation involving scheduled appointments, under certain circumstances it may be desirable to allow vendors to establish video communication with buyer terminals by direct dialing. Of course, calls may be conditioned by various tests or simply accepted. In any event, upon the completed telephonic connection from the remote location (FIGURE 2), as assumed above the specific incoming line is coupled to the monitor station V1. Specifically, the signals are received by a switch and processors, indicated at 112 (FIGURE 3), which is part of the format switch 41 (FIGURE 2), for driving the video monitor 114 incorporating the display screen 60. Specifically, the video switch and processors 112 are coupled to the video mixer 110 to provide the scene content of the display along with graphics.

The video switch and processors 112 may incorporate a variable codec for analog lines AL1-ALN and digital lines DL1-DLN. For analog lines, a video CODEC along with computing capability may take the form of an AVP1000 video CODEC chip set as available from AT&T. Essentially, the

CODEC chip set accomplishes videophone operation and consists of a video encoder, a video decoder and an internal system controller.

As known, the system controller provides and receives: video data, audio data and data signals. In that regard, the video switch and processors 112 is illustrated with cable (multiple path) connections. That is, path or line AL1 is one of the series of lines AL1-ALN carrying an encoded videophone signal between the telephone switch 43 and the video switch and processors 112. A line 113 then carries received video data to the video mixer. A line 115 (bus or cable) carries several other signals to the monitor 114, specifically, transmitted and received audio, transmitted video and data signals. The video switch and processors 112 also is connected to the control computer 44 for data signal flow.

A logic program indicating the control operations of the control computer 44 will now be treated with reference to FIGURE 6. The program is entered at a line 130 (upper center) shown leading to a decision or query block 132. The query posed by the query block 132 relates to whether or not the next appointment is timely as recorded in the memory 32 (FIGURE 3). To that end, in the sequence dial-up operation of the system, the control computer 44 determines with reference to the clock 40 (FIGURE 2) whether it is time for initiating the next appointment. Proper time prompts a "yes" path from the block 132 and the process will proceed to a block 134 and pursue a path to fetch location data for the next call. As indicated by a block 136, the next call is placed on the proper format line, depending upon the recorded data (FIGURE 4, cell 70) and whether the location being called has videophone, video still (high quality) or hi-fi video capabilities.

The operation then introduces a query as posed by a block 142 to determine if there is an "answer." If there is no answer, as indicated by line 143, the call is automatically terminated after a predetermined number of

rings or a predetermined time period has passed. Of course, the call is only terminated after providing the caller with an option of leaving a message, as indicated by block 144. Alternatively, if the call is "answered," a cue for the PIN number is provided as indicated by block 146.

Operation continues with a query block 148 to determine if the PIN number has been entered. The circumstance of "no" PIN number returns the program to block 144 and terminates the call. If the PIN number is correctly entered, the program continues to a query block 150, to determine if contact with the desired remote location is established. Once again, in the event of a substantial delay, a "no" is prompted followed by termination of the call at block 144.

Following the alternative "yes" path from the block 150 indicating that the buyer is on the line, advances the program to a block 152. The resulting operation is to formulate the buyer graphic display. As indicated above, in one embodiment, the data is simply addressed in the memory 32 (FIGURE 3) by a four-digit number uniquely designating each remote location.

With the available telephone number, the auto dialer 36 is actuated during the interval while the graphics data is prepared for display. Once the buyer graphic display has been formulated, the call is transferred to the buyer as indicated by block 154. Exiting from the block 154, block 156 cues the buyer with cues such as "Time is up" or "Appointment waiting."

Thus, the system accomplishes a sequence of displays representative of the remote locations L1-Ln. As indicated above, a single monitor station may be employed; however, in the disclosed embodiment, several monitor stations V1-Vn share the sequence accommodating interruption either for manually controlled "outgoing" calls or "incoming" calls.

Essentially, coordinated with the control computer 44, (see FIGURE 4, cell 70) reapportioning and rebilling options are executed by the billing data unit 49, utilizing storage

capacity of the memory 32 and the printer 51a. These operations involve a supplemental step 158 (see FIGURE 5).

FIGURE 8 illustrates a more specific exemplary form of the system TIS. The telephone interface switch 43 (upper left) accommodates a multitude of line connections to the dial-up public telephone system TS (FIGURES 1 and 2) accommodating two-way communication with various capabilities as treated above.

The telephone interface structure 43 (FIGURE 8) accommodates the placement of outgoing calls by an auto dialer 30 controlled by a control computer 44 incorporating substantial memory. Auto dialers are well known in the telephone arts functioning to place calls in response to digital instructions. As the source of such digital instructions, along with others, the control computer 44 comprises a substantial computing capability, functioning to control telephonic traffic in various communication forms through the telephone interface structure 43. Traffic is controlled, both for servicing and interconnecting remote terminals at both vendor and buyer locations, e.g., buyer locations V1-Vn and vendor terminals, e.g. terminals L1-Ln.

The control computer 44 also is connected to an audio response unit 36 for vocally cuing and otherwise interfacing remote stations through the telephone interface structure 43. Again, various forms of audio response units are well known in the telephonic arts for verbalizing cues, receiving digital signals and performing some processing. In that regard, the audio response unit 36 may incorporate some dictionary capability or may rely on the control computer 44 for an extended dictionary of words to be vocalized.

The control computer 44 also is connected to receive signals from the telephone interface structure 43 through a "D" channel circuit 104. For example, the "D" channel circuit receives ANI and DNIS signals indicative of calling and called station numbers as explained above. Essentially, the "D" channel circuit 104 provides call related

information to the control computer 44 in accordance with well known techniques of the telephonic arts.

Recapitulating to some extent, it may be seen that the control computer 44, along with the above-mentioned structures, has substantial capability to interface with remote terminals. However, under certain conditions, manual communication also may be desired. Accordingly, as explained above, an operator station 42 is coupled to the control computer 44 to accommodate a human interface. The operator station 42 may take the form of a CRT terminal with graphics display capability and various controls (FIGURE 8) implemented through the control computer 44.

As indicated above, to accomplish the traffic control function, the control computer 44 has substantial computing capability, specifically, for purposes of control, storage management, delivery, scheduling and interconnecting remote stations. For convenience of explanation, in FIGURE 8, several operating components that could be integrated in the control computer 44 are separately illustrated. Such separate illustration also facilitates the operating explanations. Specifically, separate storage capacity is illustrated in the form of a buyer-vendor storage unit T24 and a buyer-vendor/merchandise code storage unit T26. The storage units T24 and T26 are addressed by the control computer 44 to provide data that is processed along with other data to control and facilitate on-line and off-line communications between buyer and vendor terminals.

As suggested above, communication between the various vendors and buyers involves substantial control and regulation along with limitations, thus, the term traffic control is deemed appropriate. In that regard, a qualification unit (caller test unit) 38 is coupled both to the control computer 44 and the storage units T24 and T26. Essentially, the qualification unit (caller test unit) 38 receives identification and limitation data to qualify buyers and vendors for select individual communications. The storage unit T26 is coupled directly to the control

computer 44, along with a billing data memory 49 and a printer 51a for operation as mentioned above.

Summarizing the extensive treatment above, the present system variously implements both online and offline communication as between vendors and buyers. The communication is considerably enhanced by video displays. Accordingly, a video file server 37 is coupled directly to the telephone interface structure 43 and to the control computer 44. A monitor station V1-Vn is similarly coupled, as for select time or call monitoring.

In view of the preliminary description of the structure (FIGURE 8) a comprehensive explanation of the system now may be expressed by assuming particular situations and describing typical operating sequences. Accordingly, assume the structure of FIGURE 8 is coupled as the traffic control system TIS in the system of FIGURE 2 for controlling and regulating select communications between vendor and buyer terminals. In that regard, a system of merchandise classification is used to enhance the selectivity of communication to prevent information overload. Generally, merchandise is classified in accordance with a decimal system, somewhat equated to the channels of commerce for various goods. For example, a component of such a classification is as follows.

CHART A

Merchandise	Decimal Code
Body Treatment	470000
Skin	471000
Sun Cream	47260
Prevent & Protect	471230
Water Resist	471234
Tanning	471235
Cream	471300
Moisture	471310

	Cleansing	471320
	Hair	472000

In accordance with the exemplary classification, "body-treatment" merchandise carries the code "470000". More explicit classifications of such merchandise carry additional decimal indicators. For example, as indicated above, water-resistant, sun protection treatment would be identified by the code "471234". Accordingly, entire ranges of merchandise are classified and coded to control and regulate communication traffic in accordance herewith.

Generally, preliminary inquiries, offers for sale and requests for proposals all carry merchandise codes for selectively identifying potentially interested vendors or buyers. As a further element of classification, buyers or vendors also may be assigned specific codes, for example, designating a business primarily as, supermarkets, department stores, drug stores and so on.

As detailed below, the operation of the system will be treated as it regulates and controls video communication, for example, selectively between vendors and buyers, to expedite traditionally complex purchasing operations. In that regard, the embodiment treats six types of telephone calls. Specifically, primary calls are classified in accordance with the following chart.

CHART B

Type Call	Nature
"A"	Vendor with special offering
"B"	Buyer responding to special offering
"C"	Buyer with Request for Proposal (RFP)

"D"	Vendor responding to RFP
"E"	Vendor seeking appointment
"F"	Buyer seeking appointment

Typically, calls of the various types involve some form of qualification or approval. For example, access to the system typically will be limited to qualified or registered entities. Also, certain limitations will be imposed on such entities. For example, calls that would reveal one vendor's proposal to another vendor are inhibited. Also, it may be desirable to limit calls from buyers accessing information related to another buyer. Of course, specific forms of limitations and qualifications may be implemented depending upon specific applications. However, in accordance with the disclosed embodiment, the types of calls set out above, all involve some form of qualification. The qualifications are generally performed by the qualification unit (caller test unit) 38 (FIGURE 8) utilizing information derived from a call correlated with reference data from the storage units T24 and T26. In that regard, the logic for the qualification unit (caller test unit) 38 may be implemented in accordance with the flow diagram of FIGURE 9 as will now be considered.

In the disclosed embodiment, the qualifications for buyers and vendors are somewhat similar. Specifically, the tests for a calling vendor are:

Is the calling station registered as a vendor (or buyer)?

Can the caller give a proper PIN number (Identification Number)?

Is the vendor qualified for the designated merchandise?

Is the vendor approved for an identified buyer or buyers?

The tests for calling a buyer are quite similar. To consider the logic embodied in the qualification unit

(caller test unit) 38 (FIGURE 8), reference will now be made somewhat concurrently to FIGURES 8 and 6. With the occurrence of an incoming call through the telephone interface structure 43 (FIGURE 8), "D" channel signals are supplied through the circuit 104 to the control computer 44. As a result, the control computer 44 addresses the buyer-vendor storage unit T24, using the call number of the originating terminal (ANI). Of course, in other applications DNIS signals may be similarly employed. The operation is illustrated by a block T40 (FIGURE 9). Addressed by the calling number, the storage unit T24 (FIGURE 8) supplies representative signals indicating: first, that the calling terminal does belong to a registered buyer or seller, whether the entity is a buyer or a seller, and the identification number (PIN) for the entity. The operation of consulting the storage unit T24 or look-up table is illustrated by a query block T42 in FIGURE 9.

If the calling terminal number is not located, indicating an unregistered caller, the qualification unit (caller test unit) 38 (FIGURE 8) actuates the control computer 44 for appropriate control. Specifically, the audio response unit 36 may be prompted to provide a termination message or the operator station 42 may be actuated for a human interface. Such alternatives are represented in FIGURE 9 by the block T44.

For calls originating from a registered terminal, the qualification unit (caller test unit) 38 (FIGURE 8) stores the pertinent data, i.e., buyer or seller and reference PIN. The operation is illustrated in FIGURE 9 by the block T46.

With the determination of a properly registered calling terminal, the control computer 44 actuates the audio response unit 36 providing a verbal cue for an identification number (PIN). The operation is illustrated in FIGURE 9 by the query block T48. If the caller enters keypad digital information indicating an invalid PIN, or makes no entry at all, the operation again proceeds to the

block T44 for termination or transfer of the call as explained above. With the entry of a valid PIN, the operation proceeds to store the personal identification number as indicated by a block T50.

The qualification unit (caller test unit) 38 (FIGURE 8) next functions in cooperation with the control computer 44, driving the audio response unit 36 to cue the caller for the type of call and the merchandise code, see blocks T52 and T54 (FIGURE 9) representing such operations. Although such operations are not detailed in FIGURE 9, it is to be understood that improper responses or the lack of a response will transfer the process to the function of block T44, as illustrated, to terminate or transfer the call. On the contrary, if appropriate information is received, the qualification unit (caller test unit) 38 (FIGURE 8) receives and stores the requested information. Consequently, the unit 38 contains: the caller's PIN number, the call type and the merchandise code. That data is then tested within the qualification unit (caller test unit) 38, against reference data, in a process step as illustrated by the query block T56 in FIGURE 9. The details of the test are treated in somewhat greater detail below; however, as illustrated in FIGURE 9, if the tests are not successful, the process again proceeds to the termination block T44; otherwise, the process proceeds to a block T58 to implement the substantive communication of the call.

The final test of the call involves operation of the qualification unit (caller test unit) 38 (FIGURE 8) in conjunction with the storage unit T26. That is, for each buyer and vendor, the unit T26 stores merchandise codes and, in some instances, other special information. For example, typically, vendors may be denied access to certain information. For example, a vendor would not have access to the type calls: "A" (a special offering of another vendor), "D" (another vendor responding to an RFP) and so on. However, exceptions are possible and in that regard it is

simply important to appreciate that special situations may be stored in the unit T26.

Returning to the routine situation, as indicated above, each buyer and vendor is associated with specific merchandise codes. In that regard, merchandise codes not only facilitate and expedite communication but additionally, charges and billing data (for storage in the memory 49) may be based on active merchandise codes for a subscriber.

Pursuing a specific example, assume a caller, identified as a vendor and otherwise qualified, is pursuing the presentation of a special offering. Further assume that the calling vendor is associated only with hair products (Chart A, code 472000). However, assume that the caller identifies the "merchandise of interest" to be a water resistant sun skin product, code 471234. Thus, the identified merchandise code does not coincide with the caller's registered merchandise code. In such a case, the processing is halted with the consequence that the call is either terminated or transferred to an operator. At this stage, likely operation would involve referring the call to an operator. Thus, the qualification unit (caller test unit) 38 concludes the test by assuring that the entity being represented by a call is authorized for access with respect to the identified codes.

Once a caller has been identified, the control computer 44 (FIGURE 8) functions primarily in conjunction with the video file server 37 to implement the communication. Of course, in instances where an appointment is sought, as described in detail above, the function of the video file server 37 may be relatively nominal. Note with regard to appointments, that a caller may simply request an appointment immediately within call types "E" and "F". That is, within the concept of obtaining an appointment, a caller may simply seek to speak with a particular vendor or buyer representative immediately.

To consider the specific operations, assume that the exemplary caller is a vendor with a special offering, i.e.,

call type "A". As a specific example, the caller may represent a vendor entity dealing in distressed merchandise holding a considerable volume of hair shampoo packaged for women, i.e., merchandise code "472147". With the merchandise codes stored, the control computer 44 actuates the video file server 37 along with the audio response unit 36 to receive a video presentation of the merchandise, that is, the hair shampoo. Typically, the vendor will have organized the presentation prior to making the telephone call so that the merchandise can be variously demonstrated and various information including pricing, etc., expressed in the video presentation. Thus, an effective record of the video presentation is stored in the file server 37 essentially in the form of a sales presentation for the hair shampoo, that is, product code "472147".

With the completion of the video record, the control computer 44 actuates the storage unit T26 to isolate all buyers associated with the product code "472147" identifying hair shampoo. With the list of buyers identified and a video presentation recorded, the subsequent operations involve communicating the video presentation to the select group of buyers. In accordance with the disclosed embodiment, the identified buyer group is notified of the availability of the demonstration. Thereafter, qualified buyers may establish communication (call "B") through the telephone interface structure 43 (FIGURE 8) to receive the stored video presentation from the file server 37. Various specific arrangements may be involved. The central traffic system TIS may maintain a record or log of all the buyers accessing the video file server 37, which may be provided to the vendor, upon request. A record of the time (provided by the clock) spent by each buyer in viewing a video presentation may also be maintained. For example, a specific buyer may terminate the video after viewing it for only a few minutes, while another buyer may view the entire video presentation. The vendor may request such information

to determine buyers' reactions to the special offering, for marketing or other reasons.

In some situations, it may be particularly advantageous for buyers to receive early notice of a special offering by a vendor. Accordingly, it may be desirable to implement a rotational order scheme or a random operation for determining the sequence in notifying buyers. Specifically, a random number generator may be incorporated in the control computer 44 for ordering the list of buyers for notification.

Notices to buyers or vendors also may vary considerably, depending upon individual programming considerations. In some situations, vendors may provide a special list of buyers or alternatively, exclude specific buyers. All buyers and vendors are provided with a list of participating members of the network, at registration. Periodic updates of new members may be circulated from time to time.

In accordance with the disclosed embodiment, the control computer 44 simply actuates the auto dialer 30 to establish telephonic communication with buyers after which the audio response unit 36 notifies the buyer. Alternatives involve the utilization of facsimile or the like capability or various forms of electronic mail may be incorporated for utilization. In any event, the select group of buyers is notified that the presentation on a hair shampoo packaged for women is accessible by interfacing through the telephone interface structure 43. Responding buyers (call type "B") are qualified as described above, then coupled to the video file server 37 to receive the video presentation. Thereafter, interested buyers may directly contact the vendor, typically for further video communication. Thus, the foundation for a transaction is completed rapidly and effectively with substantial communication of the goods involved and related considerations.

Another possibility involves type "C" calls, whereby a buyer distributes a request for proposal. Again, various

communications may be accomplished to a select group or sub-group of vendors based on merchandise codes. To consider a specific form of communication in accordance herewith, after qualification, a buyer might use video communication to notify vendors with a graphic such as one illustrated in FIGURE 11. FIGURE 10 illustrates an exemplary buyer request form providing specific information of the merchandise. Blank forms may be stored in a forms directory (e.g. menu-driven) or the like on each buyer's terminal. Thus, when making a request for proposals, a buyer may simply access a blank form and enter the specific information. Essentially, a merchandise code number "472361" is supplied, indicating the specific product as also identified in the graphic. After the notice has been sent to vendors, a message as represented in FIGURE 11 may be transmitted to the buyer from the central traffic control system TIS. Note that a check digit may be supplied. Likewise, vendors may access blank forms, similar to the exemplary buyer request forms, to indicate special offerings.

Following receipt of a request for proposal, interested vendors may submit a video presentation as described above. Alternatively, vendors may be invited to call for an appointment or otherwise communicate their proposals to buyers. Thus, the system affords considerable flexibility in selectively communicating product information between buyers and sellers, using video formats.

In view of the above description, it will be apparent that numerous operating formats, programs and layouts may be accomplished using a wide variety of videophone equipment in cooperation with computing and telephone apparatus. As indicated above, the disclosed embodiments afford some arrangements; however, the scope hereof should not so confined, rather the scope hereof should be in accordance with the claims as set forth below.

WHAT IS CLAIMED IS:

1. An interactive system including a plurality of remote locations for communication with a central station, using dial-up telephone facilities, wherein television camera structures or television terminal units are located at said plurality of locations for providing representative dynamic image television signals representative of scenes or displays and at least one television display structure is located at said central station, wherein the improvement is characterized by:

telephonic interface apparatus for interconnecting said television structures at said remote locations to said central location; and

a control unit at said central station, including memory for storing location call data and graphic display data, said control unit for actuating said telephonic interface apparatus to establish television communication between said central station and said remote locations to provide a sequence of remote location displays at said central station showing a scene and graphic display data, said control unit further including interrupt structure for receiving an interrupt signal manifesting a predetermined circumstance to interrupt said sequence and to provide an alternate display of a scene from one of said remote locations along with graphic display data.

2. An interactive system according to claim 1, further including sensor units at said remote locations, for providing said interrupt signals to said control unit.

3. An interactive system according to claim 2, wherein said sensor units are priority coded to provide interrupt signals of different priorities and wherein said central unit provides displays in accordance with said priorities.

4. An interactive system according to claim 3, wherein said telephonic interface apparatus includes means for providing "D" channel type signals, as ANI and DNIS signals, to manifest said interrupt signals.

5. An interactive system according to claim 1, wherein said location call data comprises call schedule data for retrieval in a sequential order and for driving said telephonic interface apparatus to provide connections from a central video terminal including a speakerphone unit and a display device for providing television displays to said remote locations in accordance with said sequential order for video communication.

6. An interactive system according to claim 5, wherein said telephonic interface apparatus includes an auto dialer unit for calling said remote locations.

7. A communication traffic system for selectively enabling communications between members of plural groups, as buyer groups and vendor groups, for video communication through a dial-up telephone system, wherein the improvement is characterized by:

a telephonic interface apparatus for interfacing remote telephonic terminals of said dial-up telephone system, said terminals being identified with said members of plural groups;

a video recording unit for recording and playing video transcriptions;

a storage memory for storing data on said members of said plural groups, including telephonic terminal numbers and assigned codes; and

a control computer to selectively interconnect said video recording unit with said remote telephonic terminals through said telephonic interface apparatus to record and receive video communication.

8. A communication traffic system in accordance with claim 7, further including a qualification unit for testing said remote telephonic terminals for selective interconnection to said video recording unit.

9. A communication traffic system in accordance with claim 7, wherein said telephonic interface apparatus includes an audio response unit.

10. A communication traffic system in accordance with claim 7, wherein said telephonic interface apparatus includes an auto dialer.

11. A communication traffic system in accordance with claim 7, wherein said telephonic interface apparatus includes an audio response unit and an auto dialer.

12. A communication traffic system in accordance with claim 7, wherein said telephonic interface apparatus includes a "D" channel circuit for receiving terminal data indicative of telephonic terminal numbers, said terminal data being supplied to said control computer.

13. A communication system in accordance with claim 7, wherein said storage memory includes a memory capability storing data for testing telephonic terminal numbers for selective access to said video recording unit.

14. A communication traffic system in accordance with claim 7, wherein said storage memory includes a memory capability storing specific areas-of-interest codes for said members of said plural groups indicating approvals and wherein said control computer tests said codes for selective interconnection to said video recording unit.

15. A communication traffic system in accordance with claim 7, wherein said storage memory includes a memory

capability storing member associations with said plural groups.

16. A communication traffic system for selectively interfacing participants of one group at one plurality of remote video telephonic terminals with participants of another group at another plurality of remote video telephonic terminals through a dial-up telephone system, wherein the improvement is characterized by:

a video recording unit for recording and playing video transcriptions;

a storage memory for storing access codes for said participants of said groups; and

a control computer for selectively intercoupling said video recording unit and said pluralities of remote video telephonic terminals in accordance with said access codes in said storage memory.

17. A communication traffic system for selectively enabling communications between members of plural groups, as buyer groups and vendor groups, said communications facilitating data transmissions, stored video transcriptions and real-time video communication through a dial-up telephone system, wherein the improvement is characterized by:

a telephonic interface apparatus for interfacing remote telephonic terminals of said dial-up telephone system, said terminals being identified with said members of said plural groups;

a video recording unit for recording and playing video presentations upon request by said members of said plural groups;

a storage memory for storing data on said members of said plural groups, including telephonic terminal numbers and assigned codes; and

a control computer configured to accomplish at least one of a variety of transactions, including

selectively transmit data to select members in accordance with said assigned codes, interconnect said video recording unit with select remote telephonic terminals through said telephonic interface apparatus to facilitate viewings of said video presentations and process data obtained during said real-time video communication between said select members.

18. A communication traffic system as defined in claim 17, wherein said communication traffic system and said remote telephonic terminals comprise capabilities of transmitting and receiving analog and digital video signals.

19. A communication traffic system as defined in claim 17, wherein the improvement is further characterized by:

detail logic for maintaining a record of all telephonic charges incurred for billing said telephonic charges incurred by certain members to other members.

20. A communication traffic system as defined in claim 17, wherein the improvement is further characterized by:

detail logic for maintaining a record of all charges for product transactions and billing said charges to appropriate members.

21. A communication traffic system as defined in claim 17, wherein the improvement is further characterized by:

detail logic for maintaining a record of all transactional processing for billing charges incurred as a result of transactional processing to appropriate members.

22. A communication traffic system as defined in claim 17, wherein said control computer further comprises:

memory structure for storing real-time video conference schedule data, upon receiving calls from

members of plural groups through said dial-up telephone facility.

23. A video call center for operation with a dial-up telephone facility and a plurality of terminals at various locations including television apparatus, wherein the improvement in said video call center is characterized by:

a telephonic interface apparatus for interfacing remote telephonic terminals of said dial-up telephone facility for audio and digital communication and including a qualification capability for qualifying calls from said plurality of terminals; and

a control computer to selectively interconnect said television apparatus at said remote telephonic terminals for direct communication.

24. A video call center according to claim 23 wherein analog communication is accommodated.

25. A video call center according to claim 23 wherein said telephonic interface apparatus includes a "D" channel circuit for receiving terminal data indicative of telephonic terminal numbers, said terminal data being supplied to said control computer.

26. A video call center according to claim 25 wherein said terminal data comprises DNIS signals.

27. A video call center according to claim 25 wherein said terminal data comprises ANI signals.

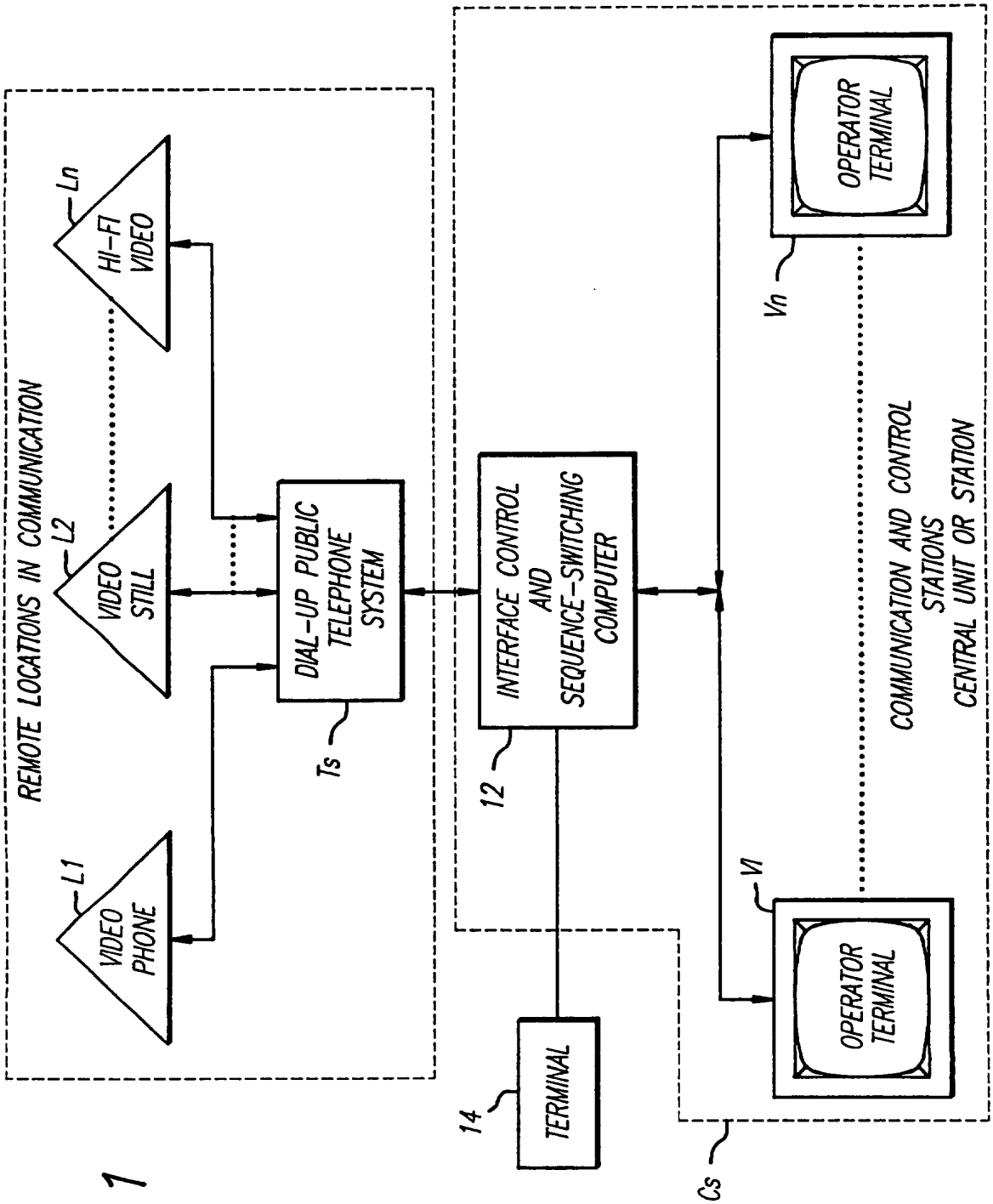

REMOTE LOCATIONS IN COMMUNICATION
L1
VIDEO PHONE
L2
VIDEO STILL
Ln
HI-FI VIDEO
DIAL-UP PUBLIC TELEPHONE SYSTEM
Ts
INTERFACE CONTROL AND SEQUENCE-SWITCHING COMPUTER
12
TERMINAL
14
COMMUNICATION AND CONTROL STATIONS
CENTRAL UNIT OR STATION
OPERATOR TERMINAL
Vn
OPERATOR TERMINAL
Vl
Cs

FIG. 1

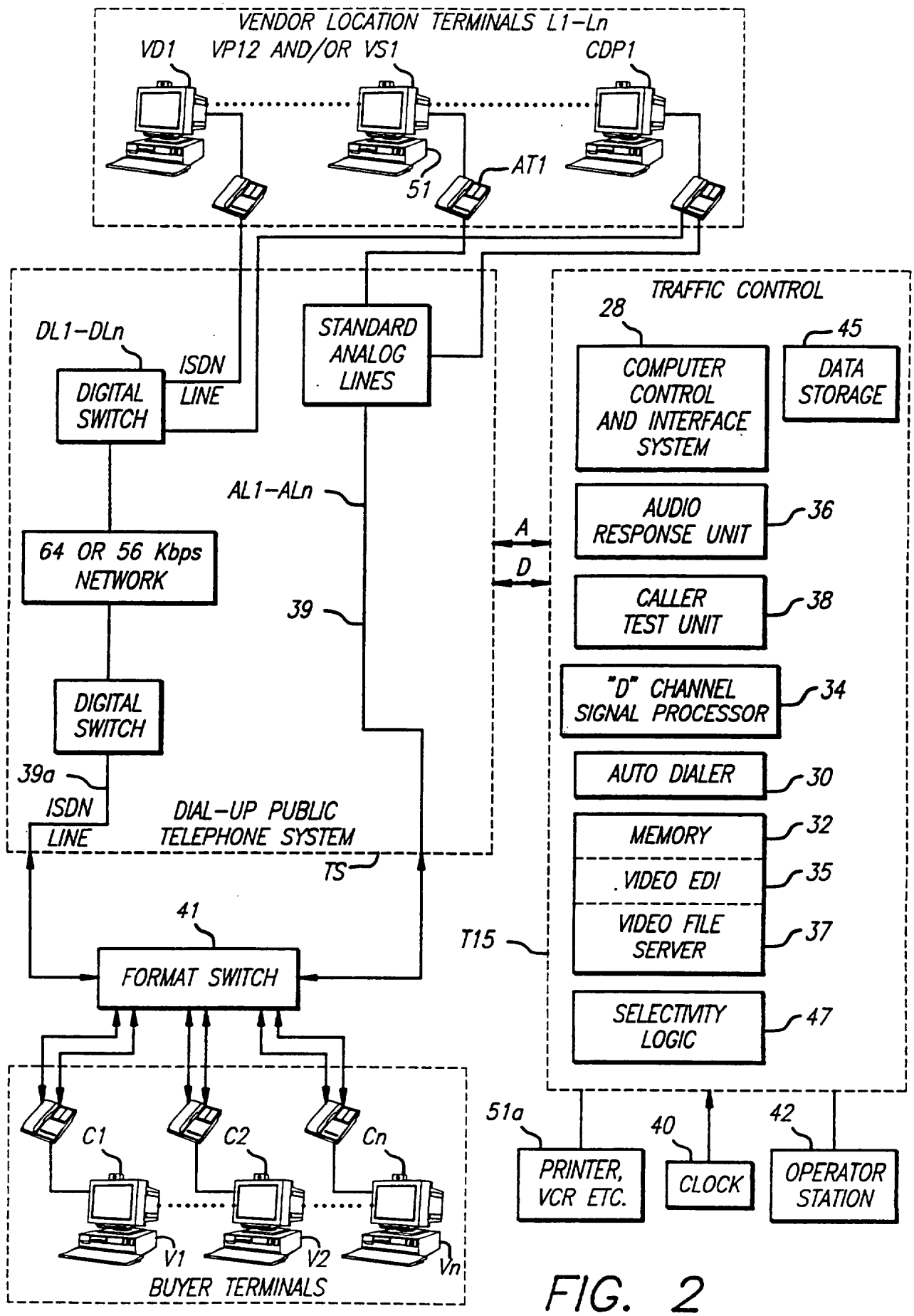
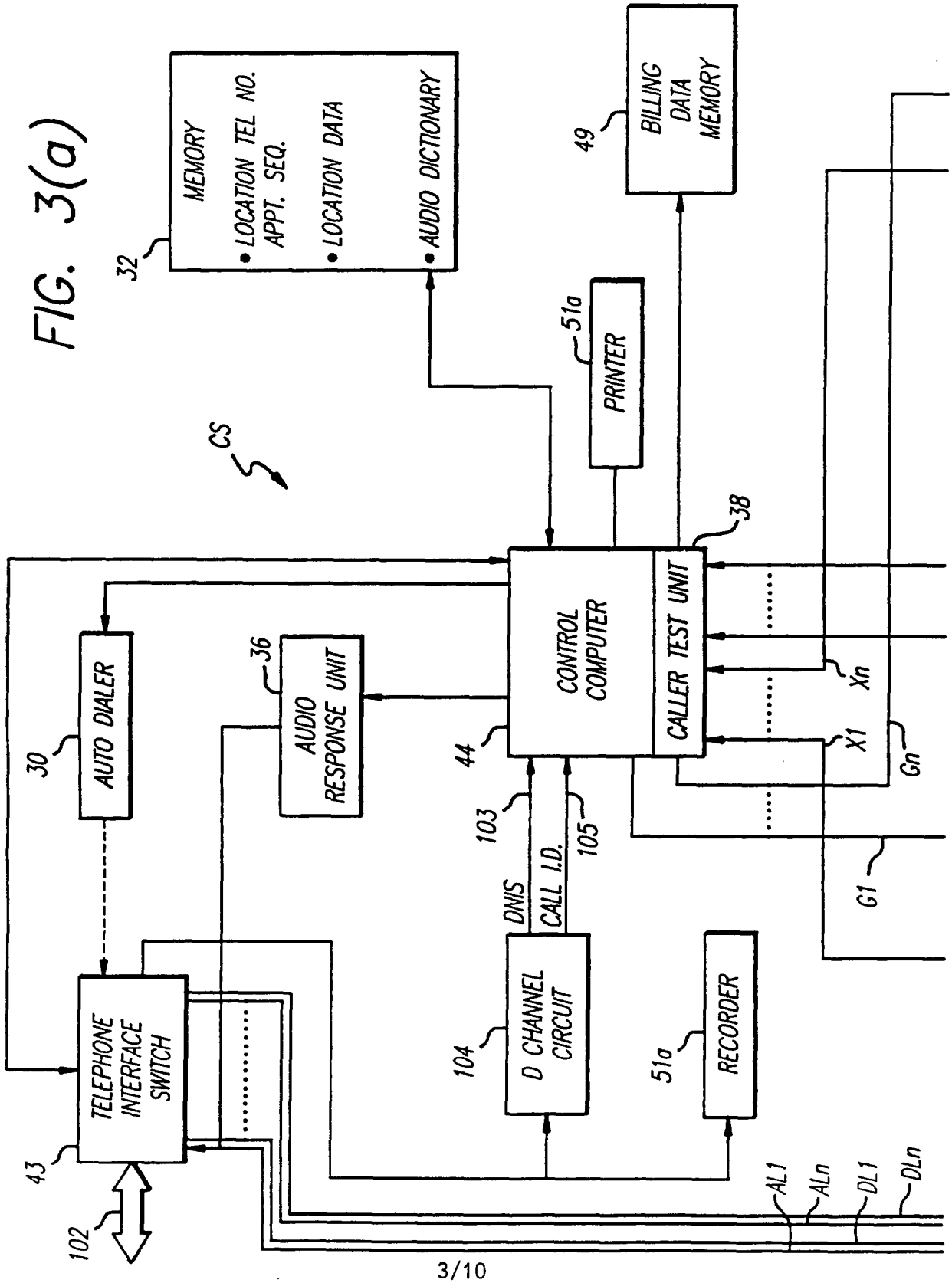

VENDOR LOCATION TERMINALS L1–Ln
VD1
VP12 AND/OR VS1
CDP1
AT1
51
TRAFFIC CONTROL
28
45
DL1–DLn
ISDN LINE
DIGITAL SWITCH
STANDARD ANALOG LINES
COMPUTER CONTROL AND INTERFACE SYSTEM
DATA STORAGE
AL1–ALn
AUDIO RESPONSE UNIT
36
A
D
64 OR 56 Kbps NETWORK
CALLER TEST UNIT
38
39
"D" CHANNEL SIGNAL PROCESSOR
34
DIGITAL SWITCH
AUTO DIALER
30
39a
ISDN LINE
DIAL–UP PUBLIC TELEPHONE SYSTEM
MEMORY
32
VIDEO EDI
35
TS
41
T15
VIDEO FILE SERVER
37
FORMAT SWITCH
SELECTIVITY LOGIC
47
51a
40
42
C1
C2
Cn
PRINTER, VCR ETC.
CLOCK
OPERATOR STATION
V1
V2
Vn
BUYER TERMINALS

FIG. 2

FIG. 3(a)


MEMORY
• LOCATION TEL NO.
APPT. SEQ.
• LOCATION DATA
• AUDIO DICTIONARY
32
BILLING DATA MEMORY
49
PRINTER
51a
CS
CONTROL COMPUTER
CALLER TEST UNIT
38
AUTO DIALER
30
AUDIO RESPONSE UNIT
36
44
103
105
DNIS
CALL I.D.
X1
Xn
G1
Gn
TELEPHONE INTERFACE SWITCH
43
102
D CHANNEL CIRCUIT
104
RECORDER
51a
AL1
ALn
DL1
DLn

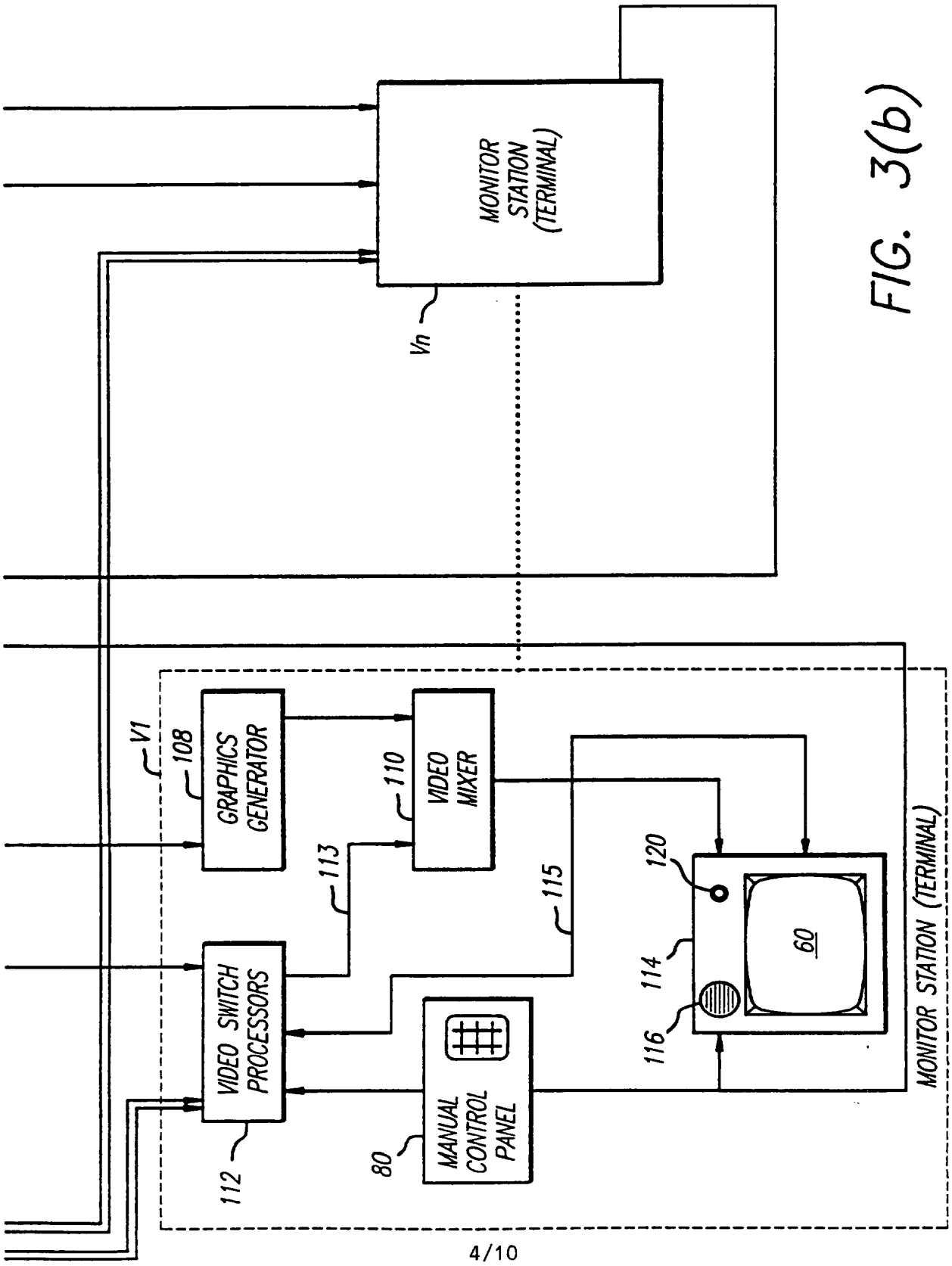

MONITOR STATION (TERMINAL)
Vn
V1
108
GRAPHICS GENERATOR
110
VIDEO MIXER
113
115
120
60
114
116
VIDEO SWITCH PROCESSORS
112
80
MANUAL CONTROL PANEL
MONITOR STATION (TERMINAL)

FIG. 3(b)

FIG. 4

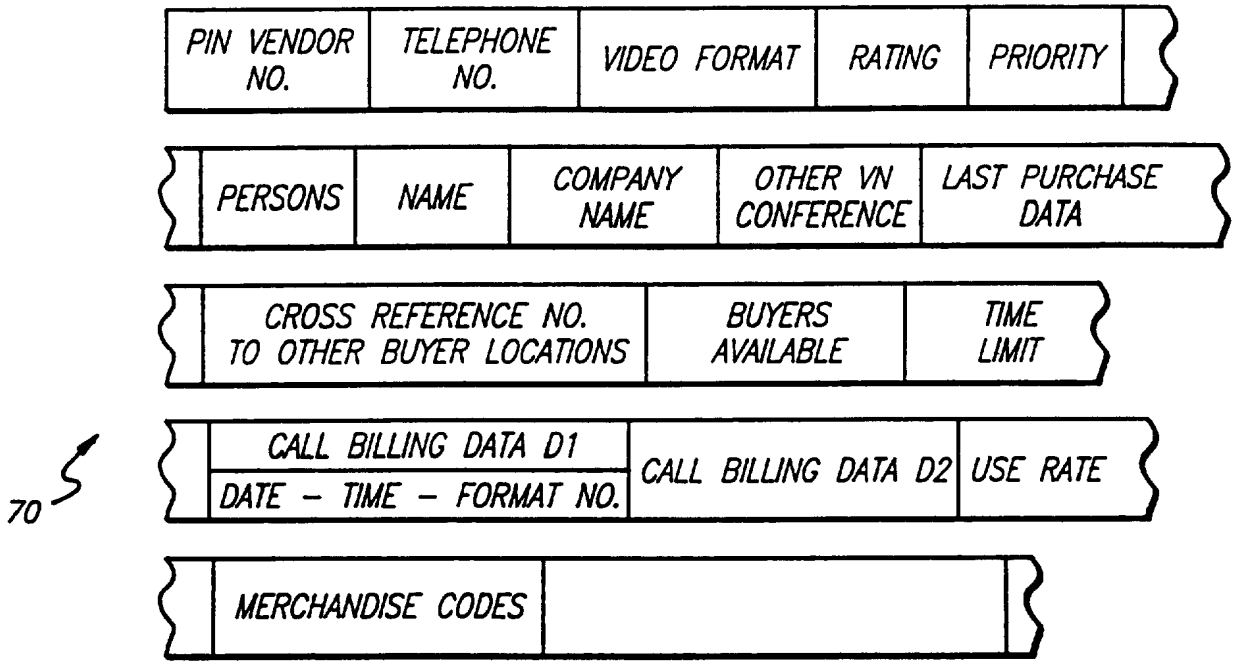
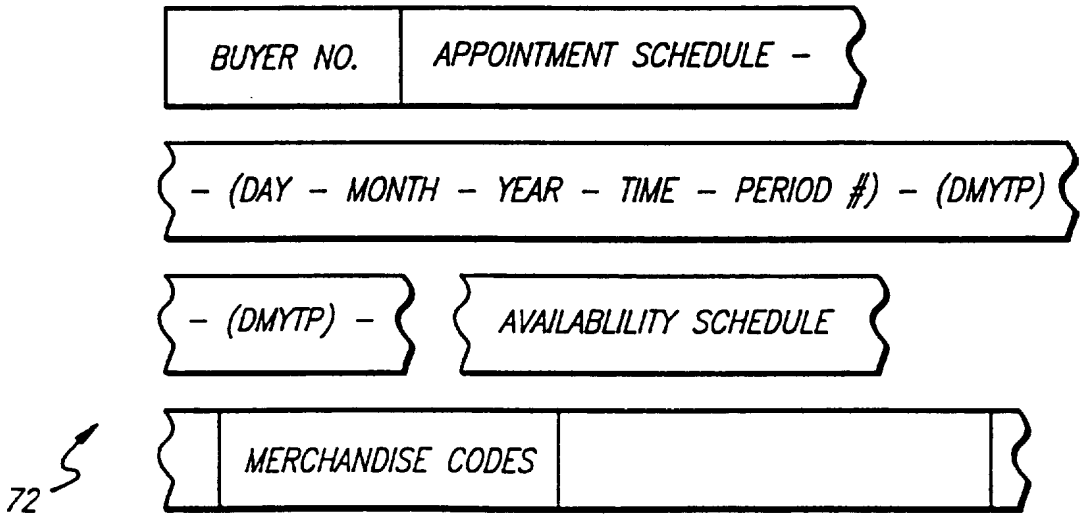

PIN VENDOR NO.
TELEPHONE NO.
VIDEO FORMAT
RATING
PRIORITY
PERSONS
NAME
COMPANY NAME
OTHER VN CONFERENCE
LAST PURCHASE DATA
CROSS REFERENCE NO. TO OTHER BUYER LOCATIONS
BUYERS AVAILABLE
TIME LIMIT
CALL BILLING DATA D1
DATE – TIME – FORMAT NO.
CALL BILLING DATA D2
USE RATE
70
MERCHANDISE CODES

FIG. 5


BUYER NO.
APPOINTMENT SCHEDULE –
– (DAY – MONTH – YEAR – TIME – PERIOD #) – (DMYTP)
– (DMYTP) –
AVAILABLILITY SCHEDULE
72
MERCHANDISE CODES

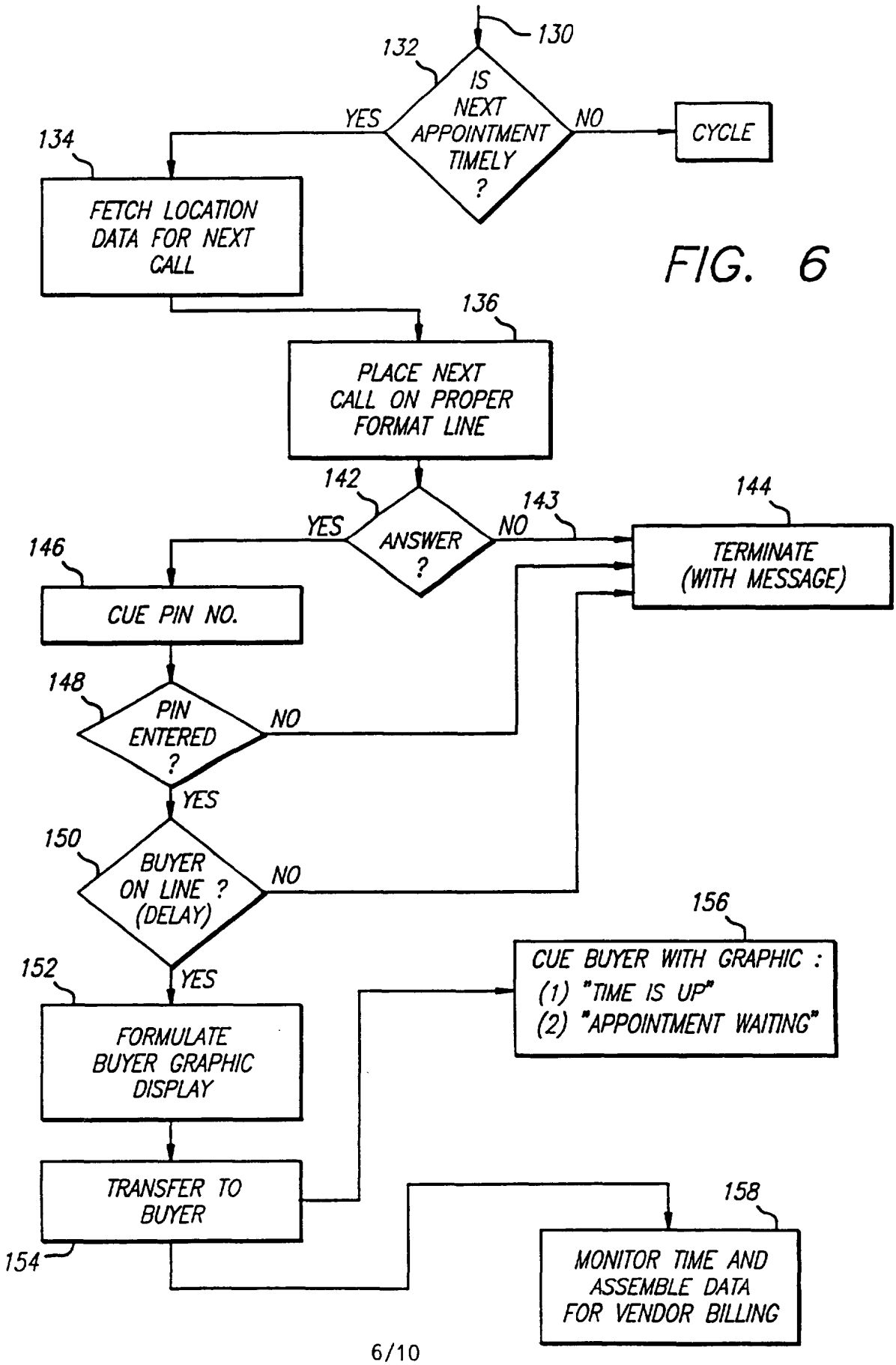
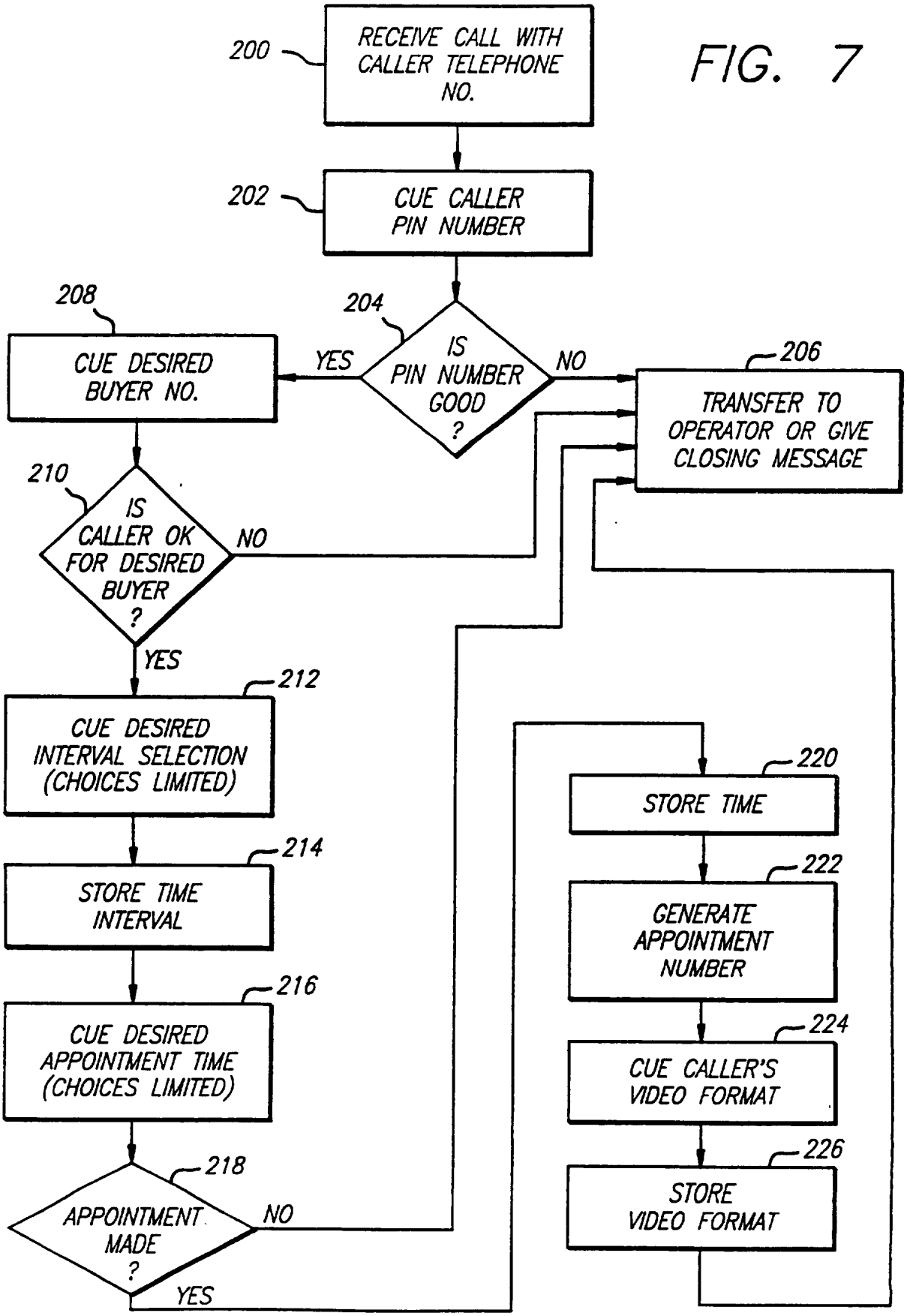

130
132
IS NEXT APPOINTMENT TIMELY ?
YES
NO
CYCLE
134
FETCH LOCATION DATA FOR NEXT CALL
136
PLACE NEXT CALL ON PROPER FORMAT LINE
142
ANSWER ?
YES
NO
143
144
TERMINATE (WITH MESSAGE)
146
CUE PIN NO.
148
PIN ENTERED ?
NO
YES
150
BUYER ON LINE ? (DELAY)
NO
YES
156
CUE BUYER WITH GRAPHIC :
(1) "TIME IS UP"
(2) "APPOINTMENT WAITING"
152
FORMULATE BUYER GRAPHIC DISPLAY
TRANSFER TO BUYER
154
158
MONITOR TIME AND ASSEMBLE DATA FOR VENDOR BILLING

FIG. 6

FIG. 7


200
RECEIVE CALL WITH CALLER TELEPHONE NO.
202
CUE CALLER PIN NUMBER
204
IS PIN NUMBER GOOD ?
YES
NO
208
CUE DESIRED BUYER NO.
206
TRANSFER TO OPERATOR OR GIVE CLOSING MESSAGE
210
IS CALLER OK FOR DESIRED BUYER ?
NO
YES
212
CUE DESIRED INTERVAL SELECTION (CHOICES LIMITED)
214
STORE TIME INTERVAL
216
CUE DESIRED APPOINTMENT TIME (CHOICES LIMITED)
218
APPOINTMENT MADE ?
NO
YES
220
STORE TIME
222
GENERATE APPOINTMENT NUMBER
224
CUE CALLER'S VIDEO FORMAT
226
STORE VIDEO FORMAT

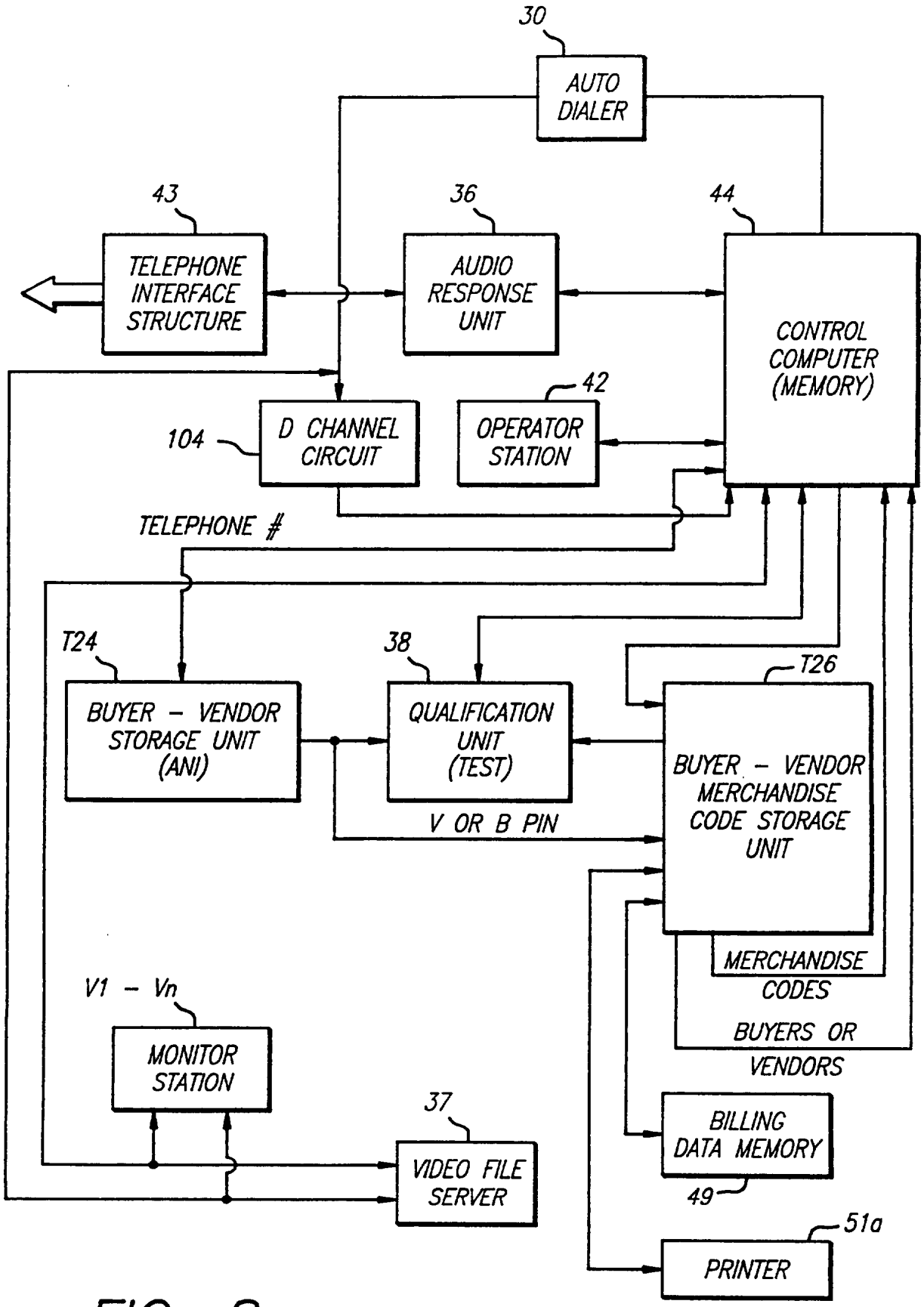

30
AUTO DIALER
43
TELEPHONE INTERFACE STRUCTURE
36
AUDIO RESPONSE UNIT
44
CONTROL COMPUTER (MEMORY)
42
104
D CHANNEL CIRCUIT
OPERATOR STATION
TELEPHONE #
T24
BUYER – VENDOR STORAGE UNIT (ANI)
38
QUALIFICATION UNIT (TEST)
T26
BUYER – VENDOR MERCHANDISE CODE STORAGE UNIT
V OR B PIN
MERCHANDISE CODES
BUYERS OR VENDORS
V1 – Vn
MONITOR STATION
37
VIDEO FILE SERVER
BILLING DATA MEMORY
49
51a
PRINTER

FIG. 8

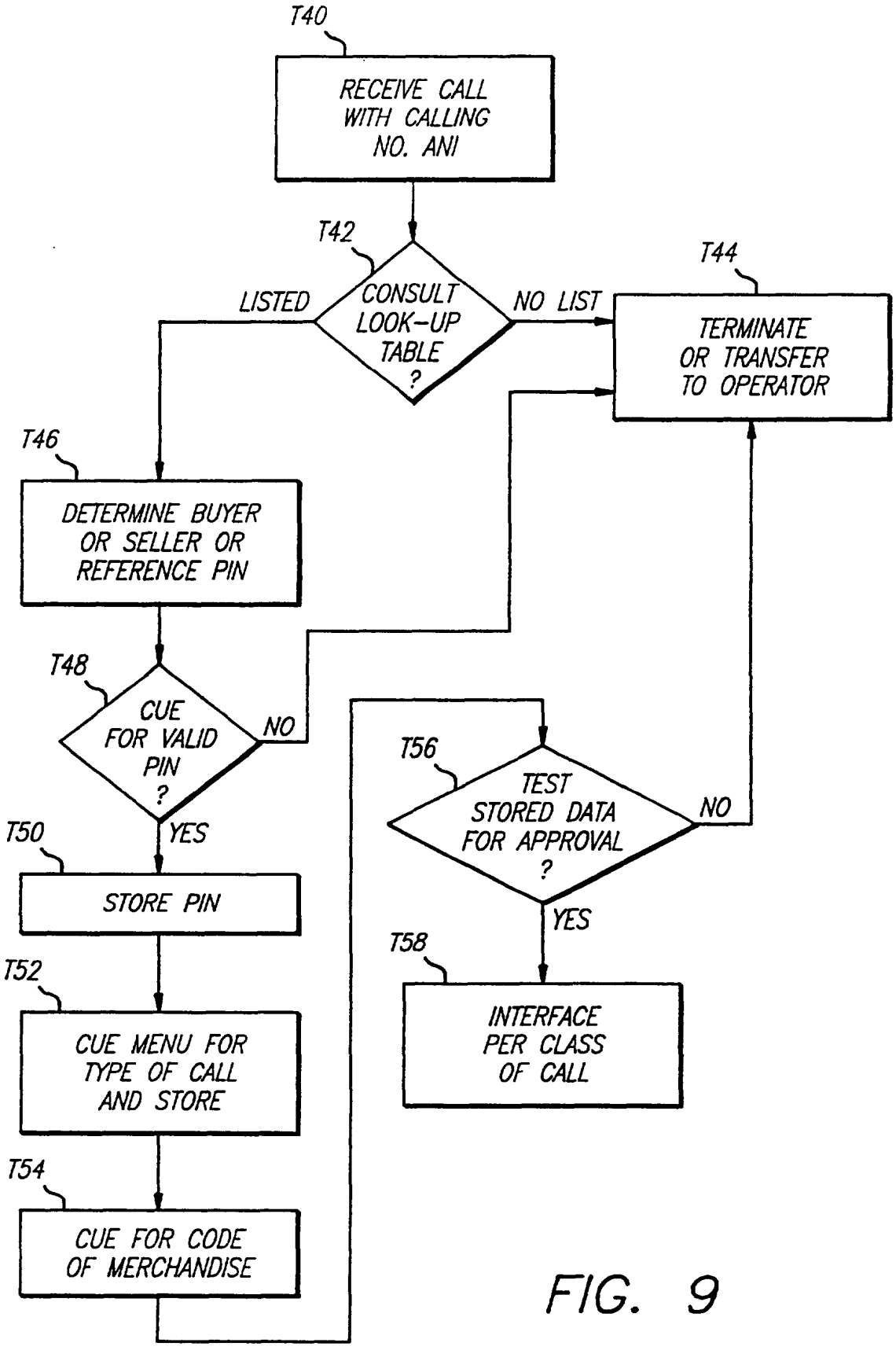

T40
RECEIVE CALL WITH CALLING NO. ANI
T42
CONSULT LOOK-UP TABLE ?
LISTED
NO LIST
T44
TERMINATE OR TRANSFER TO OPERATOR
T46
DETERMINE BUYER OR SELLER OR REFERENCE PIN
T48
CUE FOR VALID PIN ?
NO
YES
T50
STORE PIN
T52
CUE MENU FOR TYPE OF CALL AND STORE
T54
CUE FOR CODE OF MERCHANDISE
T56
TEST STORED DATA FOR APPROVAL ?
NO
YES
T58
INTERFACE PER CLASS OF CALL

FIG. 9

FIG. 10

BUYER REQUEST FORM

DATE 12-7-93 TIME 8:45 am PST BUYER CO. FOOD 4 LESS SPECIFIC BUYER LARRY ISHLI

VIDEO UNIT 714 668 5335 YOUR REFERENCE # 5127 MERCHANDISE CODE 472361

GENERAL CATEGORY BASIC HEALTH AND BEAUTY AIDS SPECIFIC CATEGORY SHAMPOO & CONDITIONERS

SUBMIT PRESENTATION

REQUEST SPECIFICS
CONDITIONING SHAMPOO FOR THE U.S. MARKET
PAPAYA BASED
12 oz. BOTTLE
UNDER $2.00 NET COST
MUST BE AVAILABLE DELIVERED TO FULLERTON, CA BY 12-18-93, 8:00 am PST
MINIMUM 10,000 UNITS
DATE/TIME OFFERS REQUIRED BY 12-7-93 3:00 pm (PST)

NOTIFICATION RECEIPT

YOUR #5127 RECEIVED, ASSIGNED TELEBUYER #681296
DISTRIBUTED TO 736 VENDORS

FIG. 11